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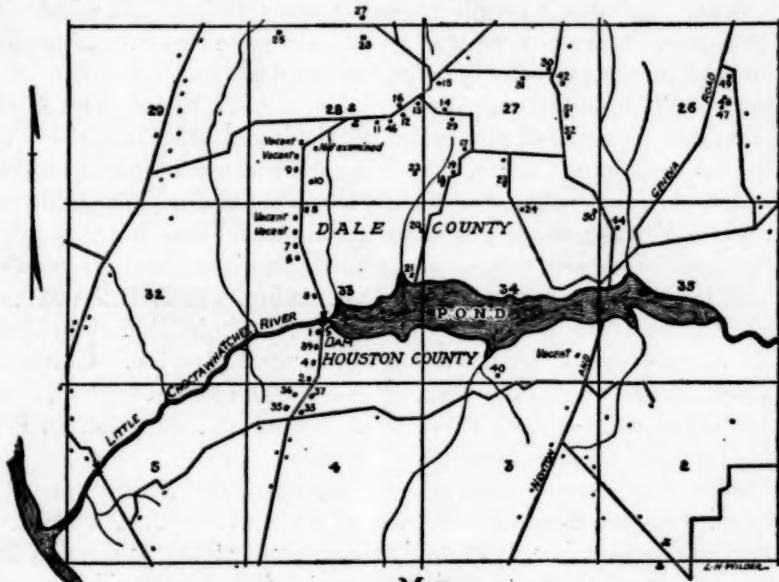
No. 12

EIGHT WEEKS' QUININE TREATMENT FOR MALARIA

A Report of Results as Observed in a Community with a High Malaria Incidence, in Dale County, Alabama¹

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History of malaria.—In January, 1921, a hydroelectric power company completed a dam across the Little Choctawhatchee River at Golden Bridge, 6 miles from Newton, Dale County, Alabama, which created a pond covering approximately 200 acres. The greater portion of the land flooded was previously more or less heavily



MAP
SHOWING DWELLINGS LOCATED NEAR POND OF THE HOUSTON POWER CO.
GOLDEN BRIDGE, DALE COUNTY, ALA.
SCALE: 3'-1 MILE

wooded with pine, magnolia, and bay, and there was much underbrush and many tree tops and logs remained from trees felled years before. No clearing or cleaning of bed and banks of the

¹ Editorial note: The study here presented illustrates how, in the presence of a complicating hookworm disease and of abundant opportunity for malarial reinfection, standard treatment for malaria may restrict the clinical manifestations of the disease without, however, accomplishing the desired result of eradication. Attention is invited to the fact that it should not be interpreted as invalidating the employment of quinine as an antimalaria procedure under suitable circumstances, but that it does emphasize the need for concurrent measures where certain serious complications are present.

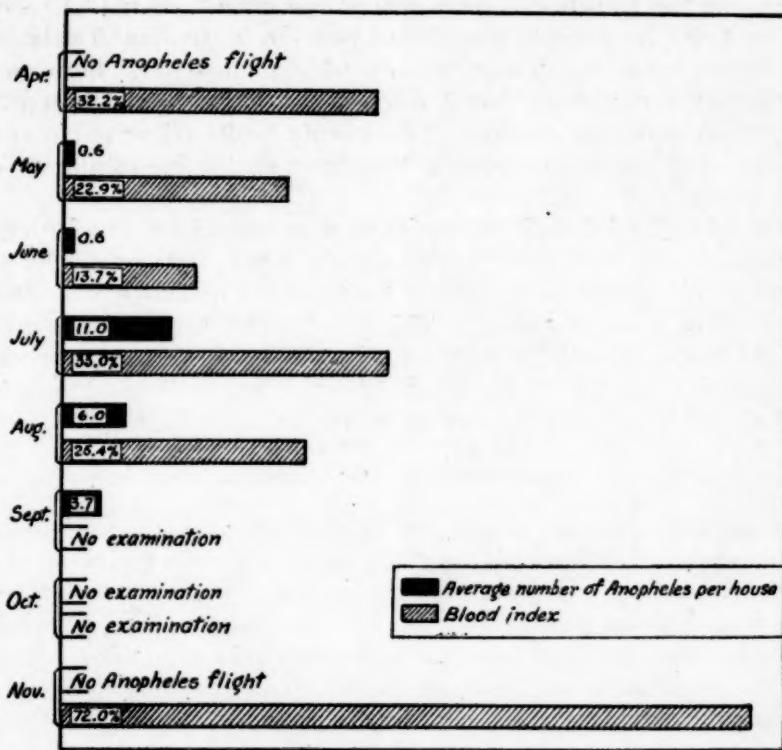
reservoir was done prior to the impoundage. Top minnows, *Gambusia affinis* and *Fundulus notii*, readily established themselves in great numbers, as a result of their previous existence in permanent small ponds in the area. Physicians who have practised in this locality for several years stated that malaria had existed endemically here before the creation of the new pond, or reservoir. In a house-to-house canvass during the second year (1922) after the pond had been created, representatives of the State board of health were able to get histories of malaria prior to 1921 in only 2 of 41 families. The year 1921, however, brought a serious prevalence of malaria. By fall of that year, according to histories elicited by a house-to-house canvass, there occurred 99 cases of malaria among the 168 people in the 41 families, or a history index of 59 per cent. Most of the cases occurred in the late summer and fall. In 1922 (September), histories of malaria occurring during that year were obtained in 161 (one death) out of 203 people living within 1 mile of the pond. In other words, 79 per cent of this population gave histories of attacks of malaria in 1922 (second year of the pond).

Status of the population.—Fourteen, or about 34 per cent, of the 41 families living within a mile of the pond own their homes, while the remaining 27 (66 per cent) are the more or less shifting tenant type, practically all of whom are living under poor conditions as regards housing, food, and social relations. There is not a house in the area effectively screened against mosquitoes, and 90 per cent of the houses have practically no screening. It is believed that there is a high rate of hookworm disease. Examination of feces was made in only seven cases, five of which were positive. Of the 41 families, 38 are white and 3 are negroes. The farms are small, and cotton is the main crop. There is one school and one church, both located within one-half mile of the pond.

Treatment of cases in 1922.—Representatives of the State board of health investigated conditions about the Golden Bridge Pond in August and September, 1922, and on September 9 began the distribution of quinine for eight weeks' treatment. The State epidemiologist personally visited the families where cases had occurred, left a week's supply of quinine each time, and gave explicit instructions as to the taking of the quinine. The record shows that quinine was supplied to members of 67 families (some living more than a mile from the pond). It was stated that about 90 per cent of the patients took the entire treatment faithfully. On October 13 the last supply of treatments was given out (two weeks' supply), and at that time it was reported that there were no cases of malaria. This statement was based on the absence of clinical cases, no blood examinations being made.

MALARIA IN 1923

Infections found early in 1923.—On April 26-28, 1923, blood specimens (thick, "puddled" smears) were taken from 87 persons living on the Dale County side of the pond, all of whom had lived within 1 mile of the pond during the malaria transmission season of 1922. Up to that time there had been no complaints of mosquitoes that season, nor had repeated examinations of houses within the infectible area shown any anophelines in the houses. Of the 87 specimens, 28, or 32.2 per cent, were positive for malaria parasites, as follows: Tertian 17, estivo-autumnal 6, mixed tertian and estivo-



Relation of house infestation by Anopheles to blood index for certain months in 1923

autumnal 4, quartan 1. As to carriers at this time, 8 specimens showed crescents, 4 of which were in simple infections and 4 in mixed tertian and estivo-autumnal infections. In the simple tertian infections there were 8 that showed gametocytes, and in all of these there were also rings or schizonts. Therefore, of these cases, which are regarded as "carried-over" infections from the previous season, 16, or 57.1 per cent, were known gametocyte carriers before the advent of any evidence of flight of *Anopheles quadrimaculatus*.

Succeeding blood indices.—A month later (May 24-26), thick smears were again taken from 2 persons who were negative in the April index and from persons not reached in April. There were 49 of these specimens, 11 (22.4 per cent) of which were positive, as follows: Tertian 8, estivo-autumnal 1, mixed tertian and estivo-autumnal 2. Six showed gametocytes (crescents 3, tertian gametocytes 3). Excluding 12 persons who had moved to this area since the preceding season, and 1 baby 4 months old—all of whom were found to be negative on blood examination—the blood index was 29.7, instead of 22.4.

On June 6, blood specimens (thick) were taken from 51 persons living on the Houston County side of the pond. Of the 51 specimens, 7, (13.7 per cent) were found positive, as follows: Tertian 3, estivo-autumnal 4. There were 2 with gametocytes, both crescents. Those persons found infected were given the 8 weeks' treatment under the direction of the county health officer of Houston County and are not included in the report on the use of quinine in this paper.

On July 23, thick and thin specimens were taken from an additional population opposite "live" water of the pond; but practically all lived within a mile of the upper limits of the quiet water. There were 39 of these specimens. Thirteen (33 per cent) were positive by the thick and only 7 (18 per cent) by the thin films. As to species of parasites in the 13 positives, 12 were tertian (1 with gametocytes) and 1 was estivo-autumnal (crescents).

ADMINISTRATION OF QUININE²

Impressed with the seriousness of the epidemic, the probability of an even higher morbidity in 1924 than during the preceding year (notwithstanding the fact that the power company was actively carrying out suggested measures for the reduction of *Anopheles* production on the pond), and considering the poor economic condition of the population, the State health officer of Alabama determined to supply quinine without cost to the people living in the affected area who would promise to take the full treatment according to instructions. Dale County has no health unit, but Houston County has; and for this reason quinine was distributed in Houston County under the direction of the county health officer. Only the Dale County cases, all white, are herein considered.

² The dosage and method of treatment employed were as follows: For the acute attack, 10 grains of quinine sulphate by mouth 3 times a day for a period of at least three or four days, to be followed by 10 grains every night before retiring for a period of 8 weeks. For infected persons not having acute symptoms at the time, only the 8 weeks' treatment. Doses for children: Under 1 year, $\frac{1}{2}$ grain; 1 year, 1 grain; 2 years, 2 grains; 3 and 4 years, 3 grains; 5, 6, and 7 years, 4 grains; 8, 9, and 10 years, 6 grains; 11, 12, 13 and 14 years, 8 grains; 15 and older, 10 grains. In most of the cases in this series having acute symptoms, the 30-grains-per-day treatment was continued longer than 4 days.

Method of quinine distribution.—From June 19 to September 3, Mr. T. D. Rivers, medical student, was engaged continuously to distribute quinine, to instruct the people how to take it during the eight weeks' course, and to keep a continuous and careful check on how well the instructions were being complied with. The writer exercised general supervision over and direction of the work. For adult patients, freshly filled 5-grain capsules were supplied, and small children were given quinine in syrup of yerba santa. Each case was visited every three days or oftener and enough quinine was left to last until the next visit. An adult member of the family, usually the mother, was given explicit instructions as to the administration. Mr. Rivers was peculiarly well adapted for the work, and at once had the confidence and friendship of the people. It is believed that the best cooperation possible among a people of this character was secured.

Table 1 presents data on the portion of the population that verbally agreed to take the full quinine treatment according to instructions and did take it in varying amounts from 50 to 99 per cent of the total eight weeks' treatment. Of the 74 people who undertook the treatment, the average amount of the complete treatment actually taken was 88.6 per cent. Twenty-four persons each took 99 per cent of the prescribed eight weeks' treatment. Of these, malaria was previously diagnosed by positive blood examination in 15 cases (62.5 per cent), and in 9 cases treatment was given on account of clinical malaria. Following the treatments, and within 10 days thereafter, examination of thick blood specimens from the 24 showed four positives (16.7 per cent,) as follows: Tertian 3, estivo-autumnal 1. In the same group there were 17 positives (70.8 per cent) on the following November 13. Of the latter, 2 were tertian, 12 estivo-autumnal, and 3 mixed tertian and estivo-autumnal (thick smears). This represented an increase of only two tertian infections during the period, against 14 estivo-autumnal.

TABLE 1.—*Cases given quinine treatment*

Case No.	Color	Sex	Age	Results of blood examination	Eight weeks' treatment			Subsequent blood examinations	
					Date completed	Per cent taken	Paroxysms after begun	Aug. 25-26	Nov. 13
5a ¹	White	Male	49	T. s. and Cr. ²	Aug. 18	99	0	Neg.	T. r.
5b	do.	Female	51	Neg. (clinical) ³	do	99	0	Neg.	Neg.
5c	do.	Male	14	T. s.	do	99	0	Neg.	T. and E. a. r. and Cr.
5d	do.	do	14	Neg. (clinical)	do	99	0	Neg.	E. a. r. and Cr.
5e	do.	do	11	T. r. and gam.	do	99	0	Neg.	T. and E. a. r.
5f	do.	do	26	T. s.	do	98	0		

¹ Numerals refer to houses and letters to members of family. House numbers in this table correspond to house numbers on the map.

² T. s.=tertian schizonts; T. r.=tertian rings; T. gam.=tertian gametocytes; E. a. r.=estivo-autumnal rings; Cr.=crescents.

³ Clinically positive.

TABLE 1.—*Cases given quinine treatment—Continued*

Case No.	Color	Sex	Age	Results of blood examination	Eight weeks' treatment			Subsequent blood examinations	
					Date completed	Per cent taken	Paroxysms after begun	Aug. 25-26	Nov. 13
5g.	White	Female	23	T. and E. a. r.	Aug. 18	99	0	Neg.	Neg.
5h.	do.	do	17	T. r. and gam.	do	99	0	T. r.	T. r. and gam.
5i.	do.	do	15	T. r. and Cr.	do	99	0	T. r.	T. r. and E. a. r.
6a.	do.	Male	49	Neg. (clinical)	Aug. 21	75	1		
6b.	do.	Female	40	Quartan bands.	Aug. 19	99	0	T. s.	E. a. r. and Cr.
6c.	do.	Male	10	T. r. and E. a. r.	do	90	3	Neg.	E. a. r. and Cr.
6d.	do.	Female	12	T. s. and gam.	do	90	0	Neg.	Cr.
6e.	do.	do	15	do	do	85	0	Neg.	Cr.
6f.	do.	do	8	Neg. (clinical)	do	90	0	Neg.	Cr.
6g.	do.	do	17	T. r. and s.	do	85	0	Neg.	E. a. r. and Cr.
6h.	do.	Male	22	Neg. (clinical)	Aug. 21	90	0	Neg.	E. a. r. and Cr.
14b.	do.	Female	35	(Clinical)	Aug. 23	80	0	T. r.	E. a. r. and Cr.
14c.	do.	Male	14	Neg. (clinical)	Aug. 21	80	0	T. r.	Neg.
14e.	do.	do	8	(Clinical)	Aug. 25	80	0	Neg.	E. a. r. and Cr.
14f.	do.	Female	6	do	do	80	0		E. a. r. and Cr.
14g.	do.	do	4	do		60			
17b.	do.	do	59	T. s. and gam.	Aug. 20	90	0	Neg.	E. a. r. and Cr.
17e.	do.	do	17	Neg. (clinical)	do	50		Neg.	E. a. r. and Cr.
17d.	do.	do	15	do	Aug. 20	90	0	T. r.	E. a. r. and Cr.
18a.	do.	Male	51	T. r.	do	90	0	Neg.	
18c.	do.	do	17	do	do	95	0	Neg.	Neg.
20a.	do.	do	61	Neg. (clinical)	Aug. 25	90	0	Neg.	E. a. r. and Cr.
20b.	do.	Female	26	do	Aug. 20	95	0	Neg.	Cr.
20c.	do.	do	5mo.	do	do	95			
21a.	do.	Male	40	do	Aug. 21	90	2	Neg.	E. a. r. and Cr.
21b.	do.	Female	34	do	do	99	0	Neg.	Cr.
21d.	do.	do	8	do	do	90	0	Neg.	E. a. r. and Cr.
21e.	do.	do	3	do	do	99			
22a.	do.	Male	31	T. s. and gam.	Aug. 20	99	0	Neg.	E. a. r. and Cr.
22b.	do.	Female	34	Neg. (clinical)	do	99	0	Neg.	E. a. r. and Cr.
22c.	do.	do	13	do	do	99	0	Neg.	E. a. a. and Cr.,
22d.	do.	Male	11	Cr.	do	99	0	Neg.	Neg.
22e.	do.	do	8	do	do	99	0	Neg.	E. a. r. and Cr.
22f.	do.	Female	5	do	do	99	0	Neg.	Neg.
22g.	do.	do	1	Neg. (clinical)	do	90	0	Neg.	T. r., E. a. r. and Cr.
23a.	do.	Male	26	do	Aug. 21	90	0	T. r.	Cr.
23b.	do.	Female	23	do	do	90	1	Cr.	Neg.
23c.	do.	do	4	do	do	90	0	Neg.	Neg.
23d.	do.	do	2	do	do	90	2	Neg.	E. a. r.
24a.	do.	Male	22	do	do	90	0	T. r.	E. a. r. and Cr.
24b.	do.	Female	20	do	do	60	0	T. r.	E. a. r. and Cr.
24c.	do.	do	9mo.	(Clinical)	do	95	0	T. r.	E. a. r. and Cr.
25a.	do.	Male	23	T. s. and gam.	Aug. 19	99	0	Neg.	E. a. r. and Cr.
25b.	do.	Female	19	T. s. and gam. E. a. r. and Cr.	do	99	0	Neg.	Neg.
25d.	do.	Male	21	T. s. and gam.	do	90	0	Neg.	E. a. r.
25e.	do.	Female	22	T. s.	do	99	0	Neg.	E. a. r. and Cr.
26c.	do.	do	13	do	Aug. 20	80	0	Neg.	Neg.
26d.	do.	do	8	Neg. (clinical)	do	80	0	E. a. r.	Cr.
26e.	do.	do	4	T. r.	do	80	0	E. a. r.	Neg.
27b.	do.	do	31	Neg. (clinical)	do	50	0	Neg.	E. a. r. and Cr.
27c.	do.	Male	9	do	Aug. 20	99	0	Neg.	Neg.
27d.	do.	Female	6	do	do	99	0	Neg.	E. a. r. and Cr.
27f.	do.	Male	2	do	do	99	0	Neg.	Neg.
29a.	do.	do	30	do	Aug. 24	95	3	T. r.	Neg.
29b.	do.	Female	do	do	do	90	0	Neg.	Neg.
29c.	do.	Male	3	do	do	85			
29d.	do.	do	4mo.	T. r. and T. s.	do	75	0		
30a.	do.	do	39	Neg. (clinical)	Aug. 20	95	0		
30c.	do.	do	4	do	do	95	0	Neg.	E. a. r. and Cr.
31a.	do.	do	30	T. s. and Cr.	Aug. 19	80	0	Neg.	Cr.
51a.	do.	Female	30	(Clinical)	Aug. 23	90	0	Neg.	
51b.	do.	Male	3	do	do	80	0	Neg.	
51c.	do.	do	8	do	do	90	0	T. s. and Cr.	
51d.	do.	Female	70	do	do	75	0	Neg.	
52a.	do.	Male	34	do	Aug. 20	60	0	Neg.	
52b.	do.	Female	28	do	Aug. 21	75	0	Neg.	Neg.
52c.	do.	Male	10	do	do	80	0	Neg.	Neg.
52d.	do.	do	(?)	do	do	80	0	Neg.	Cr.
52e.	do.	do	(?)	do	do	80	3	Neg.	Neg.

Of 7 who took 95 per cent of the treatment, 1 (14.3 per cent) was positive on blood examination (tertian) and 6 were clinically positive before treatment was begun. Within 10 days after the treatment had been discontinued, this group showed 3 positives (42.9 per cent)—2 tertian and 1 estivo-autumnal. In the November 13 examination this group gave 5 positives (71.4 per cent), all estivo-autumnal.

A group of 19 took 90 per cent of the treatment, 4 of them being positive tertian and 1 estivo-autumnal, by thick smears (26.3 per cent), and 14 clinically positive before starting the treatment. Within 10 days after stopping treatment thick smears showed 4 positives (21.2 per cent), as follows: Two tertian, 1 estivo-autumnal, 1 mixed tertian and estivo-autumnal. On November 13, thick smears from the same persons showed 13 positives (68.4 per cent), as follows: No simple tertian, 12 estivo-autumnal, and 1 mixed tertian and estivo-autumnal, a decrease of 2 tertian and an increase of 11 estivo-autumnal infections from August 26 to November 13.

There were 15 who took from 80 per cent to 90 per cent of the full treatment. Five (33.3 per cent) of them showed parasites by thick smears—4 tertian and 1 estivo-autumnal—before treatment. After treatment and before time for new infections to be demonstrable, thick smears showed 4 positives (26.7 per cent), as follows: Two tertian and 2 estivo-autumnal. On November 13, there were 9 positives (60 per cent), all estivo-autumnal (thick smears).

Of the remaining 9 persons who took 50 per cent (2), 60 per cent (3), and 75 per cent (4) of the treatment, 1 (11 per cent) was diagnosed by thick smear and 8 were diagnosed clinically before treatment. Within 10 days after stopping treatment, there was 1 (11 per cent) tertian by thick smear, while specimens from these same persons taken on November 13 showed 9 positives (100 per cent), all estivo-autumnal.

Relative results, clinically and on blood examinations.—From the standpoint of keeping the people well enough to attend to their ordinary duties, this endeavor to sterilize the blood of malaria cases might be regarded as successful, for only seven of the seventy-four treated cases (9.4 per cent) experienced paroxysms after the treatment was begun. Five of the seven were those who ultimately took 90 per cent or more of the prescribed treatment, the other two taking 75 per cent and 80 per cent, respectively. In other words, 90.6 per cent of the people treated were free from frank manifestations of malaria during the eight weeks' course. However, blood specimens (thick) taken on August 25-26—in all cases less than ten days following the discontinuance of quinine—from those treated, showed that

of 67 treated cases 17 (25.4 per cent) were infected, as follows: Tertian, 10; estivo-autumnal, 5; mixed tertian and estivo-autumnal, 2. There were 9 with crescents, while none showed tertian gametocytes.

On the following November 13, thick blood smears were secured from 68 of the treated cases, with the following results: Tertian, 2; estivo-autumnal, 43; mixed tertian and estivo-autumnal, 4—a total of 49 infections (72 per cent). This was an increase of 46.6 per cent from August 26 to November 13. There were gametocytes in one simple tertian infection and crescents in 40 (85.1 per cent) of the estivo-autumnal and mixed tertian and estivo-autumnal infections. These results show a reduction of 4 tertian infections and an increase of 40 estivo-autumnal; an increase of one tertian with gametocytes and 40 estivo-autumnal with gametocytes.

HOUSE INFESTATION—*ANOPHELES QUADRIMACULATUS*

With the removal of brush, logs, vegetation, and flotage about the shores, and the application of Paris green at 10-day periods from May 15 to October 1, production of *Anopheles quadrimaculatus* in the pond was considerably reduced during the season of 1923. Table 2 shows the catches of *Anopheles* in houses located at various distances within one mile of the pond. No count of *Anopheles* was made during previous years, but one observer stated that there were "hundreds" per house. It will be noted that the highest average count for August, which should represent the maximum infestation in this locality, was only 98 specimens (*quadrimaculatus*) in 16 houses, or an average of 6 per house. However, with the relatively small number of vectors, and a relatively large number of gametocyte carriers distributed throughout the area from the beginning of the season, the percentage of infective *Anopheles* must have been high. As to how much of the great increase in the number of persons showing infections by the blood specimens taken November 13 over those of August 25-26 was due to infections acquired during this time, or what part recrudescences or relapses played in these results, data are not at hand to justify definite statements.

TABLE 2.—*Anopheline check in houses*¹

House No.	April		May		June		July		August		September	
	Day	No. A. q. ²	Day	No. A. q.	Day	No. A. q.	Day	No. A. q.	Day	No. A. q.	Day	No. A. q.
5.....	26	0			8	1			15	36	20	5
6.....	26	0	22	0					15	44	4	8
7.....	26	0			8	0					20	11
9.....									15	0		
18.....	26	0	22	0					15	1	4	5
46.....									15	0		
12.....	26	0							15	0	5	1
20.....									15	0		
15.....	26	0	22	0					15	0		
22.....									15	5	4	4
17.....	26	0	22	0							4	1
18.....	26	0										
20.....											4	2
21.....	26	0	22	0							4	6
23.....									25	2		
24.....										4		3
14.....										4		3
40.....							16	4				
2.....			22	4							4	1
25.....											4	2
26.....											4	0
27.....												
47.....									15	2		
48.....									15	0		
49.....									15	1		
44.....									15	5		
50.....									15	1		
X.....									15	1		
Y.....												
Z.....					8	1	19	18				

¹ First *Anopheles quadrimaculatus* (2 specimens) from larvae taken from the pond emerged on April 26. First *Anopheles* found in houses May 22.

² A. q. = *Anopheles quadrimaculatus*.

³ *Anopheles crucians*.

Summary

	April	May	June	July	August	Septem- ber
Number of houses.....	9	6	3	2	16	14
Number of mosquitoes caught.....	0	4	12	22	98	52
Average per house.....	0	.66	.66	11	6.1	3.7

¹ One *A. quadrimaculatus*, 1 *A. crucians*.

CONCLUSIONS

(1) Under arrangements as satisfactory as could be made for having the eight weeks' quinine treatment for malaria taken by rural people as represented by the group herein considered, it was not practicable to get the entire treatment taken as recommended.

(2) Sufficient effect from quinine was secured to prevent frank manifestation of malaria in 90.6 per cent of the persons treated, but in 25.4 per cent of the group, parasites were found on examination of thick smears after the supervisory treatment, and before sufficient time had elapsed for new infections to show in the blood. In the group of 74 people treated, 36.5 per cent were positive on blood examination before treatment. After the treatment 25.4 per cent showed parasites, a reduction of only 11.1 per cent.

(3) In a heavily infected, poorly nourished population, with a probable high rate of hookworm disease, the quinine treatment, as

taken, failed to free a large percentage of cases of either asexual or sexual forms of the parasites, but did prevent, to a great degree, the development of paroxysms.

(4) From the last week of August to the second week of November, during which time no supervisory quinine treatment was given, the increase of infections, as shown by examination of thick blood smears, was 46.6 per cent, the great increase being due largely to the number of infections by *P. falciparum*.

(5) If the late season infections were newly acquired infections, the transmission occurred through a relatively small number of vectors with an increasingly high number of gametocyte carriers toward the end of the season.

Acknowledgements: The writer gratefully acknowledges his indebtedness to Dr. S. W. Welch, State Health Officer of Alabama; to the laboratory of the State Board of Health, and particularly to Miss Sophie Dehler, who assisted in the blood index work, including the examination of specimens; to Mr. T. D. Rivers for his very painstaking work in the distribution of quinine and the checking of its use; and to Mr. Albert R. Killebrew, General Manager of the Houston Power Co., for transportation and other services in connection with the work.

ABSENCE OF TRANSFERABLE IMMUNIZING SUBSTANCES IN THE BLOOD OF MORPHINE AND HEROIN ADDICTS

By A. G. DUMEZ, Pharmacologist, and LAWRENCE KOLB, Surgeon, United States Public Health Service

The assumption that substances so well defined chemically as the alkaloids can give rise to the formation of antibodies is contrary to the generally accepted principles of the theory of immunity. Nevertheless, several investigators, Gioffredi (1), Hirschlaff (2), and von Marikovsky (3), have reported experiments upon which the claim is made that protection against a fatal dose of morphine can be transferred to normal animals by the injection of some of the blood serum of animals rendered tolerant to large doses of the alkaloid. Other investigators have failed to confirm these findings. Thus, Morgenroth (4), Cloetta (5), Biberfeld (6), and Pellini and Greenfield (7) report that the results of their experiments show that protection can not be transferred in this manner. A critical review of the work of the foregoing investigators, with the exception of that of Biberfeld, is given in the paper published by Pellini and Greenfield, and is therefore deemed to be unnecessary here. Suffice it to add that Biberfeld observed the effects on rabbits of a narcotic dose of morphine before and after the subcutaneous injection of the blood serum of a dog rendered tolerant to large doses of the alkaloid. Typical narcotic symptoms made their appearance in all cases, showing the lack of any protective action of the serum.

The experiments recorded below were begun about two years ago, and were undertaken as a phase of the studies in drug addiction being carried out by the United States Public Health Service. The results obtained were similar to those reported for morphine by the second group of investigators named, and are offered as confirmatory evidence of the fact that transferable immunizing substances are not present in the blood serum of morphine and heroin addicts.

EXPERIMENTAL WORK

The experiments here described are, by virtue of the manner in which they were carried out, divided into two groups. In the experiments falling in the first group, the minimal fatal doses of morphine sulphate and heroin hydrochloride, when injected subcutaneously in aqueous solution, were established, and the protective effect of the serum against these doses was then tested. In the experiments of the second group the effect of the serum was tested against an increasing dosage of the drugs, beginning with a sublethal dose and ending with a surely fatal dose, thus eliminating any factor of uncertainty which may have been introduced in determining the minimal fatal doses.

In both groups of experiments the blood serum of human beings only was used. The addict serum was obtained from blood taken from morphine and heroin addicts shortly after their entrance into a certain hospital for treatment, the blood being drawn 24 to 48 hours after the last dose of opiate had been taken and when withdrawal symptoms were in evidence. The blood was placed in the refrigerator overnight, and the serum was separated from the clot just before using. When necessary the serum was centrifuged. The serum used in the control tests was obtained from the blood of normal persons known to be nonaddicts. The blood was collected at approximately the same time as the addicts' blood and was subjected to the same treatment.

The test animal used was the white mouse. It was chosen principally because it is the animal which was used by most of the others who have worked on this problem and because its small size made it possible to carry out the greatest number of tests with the limited quantities of serum obtained. In all of the experiments the mice were selected with a view to securing healthy animals of fairly uniform weight. Food and water were withheld from them for a period of 18 hours immediately preceding weighing and the application of the tests.

The injections, whether of the alkaloidal salts in simple aqueous solution or in solution mixed with serum, were made into the subcutaneous tissues of the abdomen, the site of the puncture being pinched to prevent the escape of any of the liquid. When serum was given alone prior to the administration of the alkaloidal salts, it was injected into the subcutaneous tissues of the back.

EXPERIMENTS: GROUP I

For the determination of the minimal fatal doses of morphine sulphate and heroin hydrochloride, the drugs used by the addicts from which blood was obtained, sufficient quantities of these alkaloidal salts were dissolved in distilled water to make 1 cubic centimeter of the solution contain 10 milligrams of drug. These solutions in amounts representing increases in the size of the doses were then injected into several groups of mice and the death rate was noted. The minimal fatal dose taken was the dose which would surely produce death in a large majority of the animals tested. For morphine sulphate, this was found to be 0.40 to 0.45 milligram per gram weight of mouse; for heroin hydrochloride, 0.15 to 0.2 milligram. Only those deaths occurring within $3\frac{1}{4}$ hours in the case of morphine sulphate and in 1 hour in the case of heroin hydrochloride were recorded as being due to acute intoxication. Tables 1 and 2 show the results of these tests.

TABLE 1.—*Minimal fatal dose of morphine sulphate*

Dose of morphine sulphate per gram of body weight	Number of mice tested	Number of deaths within $3\frac{1}{4}$ hours	Per cent of deaths
<i>Mg.</i>			
0.20	6	0	0
.25	6	1	16.7
.30	12	5	41.7
.35	12	8	66.7
.40	10	6	60.0
.45	18	16	89.0

TABLE 2.—*Minimal fatal dose of heroin hydrochloride*

Dose of heroin hydrochloride per gram of body weight	Number of mice tested	Number of deaths within 1 hour	Per cent of deaths
<i>Mg.</i>			
0.08	6	1	16.7
.10	6	1	16.7
.15	12	6	50.0
.20	23	19	82.6

Having established the minimal fatal dose of morphine sulphate as 0.45 milligram per gram of body weight and that of heroin hydrochloride as 0.2 milligram per gram, the tests to determine the effect of injections of addict serum on the death rate were carried out. The serum was injected alone preceding the injections of fatal doses of these drugs and simultaneously in admixture with different amounts of solutions of the drugs. The mixtures were incubated at 37° C. for a period of one hour. Controls were run in all cases, using the serum obtained from persons known to be nonaddicts. The results of these tests are presented in Tables 3 and 4 and show that in no case can

it be said that the addict serum produced an effect differing in nature from that of the control serum.

These tests show that the effect of both addict and normal serum was to lower the death rate slightly and that the extent to which it was lowered was approximately the same in both cases. One or all of several factors may have been responsible for this. In the first place, the mice in these tests received by injection a total amount of fluid in excess of that injected into the mice upon which the minimal fatal dose tests were made, thus making the dilution higher; secondly, the viscosity of the serum may have retarded absorption; and thirdly, all human serum may have the property of fixing certain amounts of these alkaloidal salts. Since these factors were operative, in the controls as well as in the tests made with addict serum, they were ignored in comparing the action of the sera tested.

TABLE 3.—*Effect of blood serum of morphine addicts on the death rate for the minimal fatal dose of morphine sulphate*

Series	Dose of morphine SO ₄ per gram weight	Number of mice	Number of deaths	Per cent of deaths
	<i>Mg.</i>			
I	.45	14	12	86
II	.45	10	7	70
III	.45	7	5	71
Control	.45	8	5	62

Group I: Received 0.5 c. c. of morphine addict serum subcutaneously. One hour later, 0.45 mg. of morphine SO₄ in aqueous solution (1 c. c.=10 mgs.).

Group II: 20 c. c. morphine addict serum+20 c. c. of morphine SO₄ solution (1 c. c.=10 mgs.) were incubated for 1 hour at 37°. Of this mixture an amount equivalent to 0.45 mg. of morphine SO₄ per gm. weight of mouse was injected subcutaneously.

Group III: Same as Group II, except that 30 c. c. of addict serum were incubated with 10 c. c. of morphine SO₄ solution (1 c. c.=20 mgs.).

Control: Same as Group III, except that the serum of a nonaddict was used in place of addict serum.

TABLE 4.—*Effect of blood serum of heroin addicts on the death rate for the minimal fatal dose of heroin hydrochloride*

Series	Dose of heroin HCl per gram	Number of mice	Number of deaths	Per cent of deaths
	<i>Mg.</i>			
I	.2	22	13	59
Control	.2	10	7	70
II	.2	12	9	75
Control	.2	16	10	63
III	.2	10	4	40
Control	.2	10	4	40
IV	.2	8	5	62
Control	.2	8	5	62

Group I: Received 0.5 c. c. of heroin addict serum subcutaneously. One hour later, 0.2 mg. per gm. of heroin HCl in aqueous solution (1 c. c.=10 mgs. heroin HCl).

Group II: 25 c. c. of heroin addict serum+25 c. c. of heroin HCl solution (1 c. c.=10 mgs.) were incubated for 1 hour at 37°. Of this mixture an amount equivalent to 0.2 mg. of heroin HCl per gm. of mouse was injected subcutaneously.

Group III: Same as Group II, except that 32 c. c. of heroin addict serum were incubated with 16 c. c. of heroin HCl solution.

Group IV: Same as Group II, except that 30 c. c. of heroin addict serum were incubated with 10 c. c. of heroin HCl solution.

Controls: The controls received the same as the respective groups, except that the serum of a nonaddict was used in place of addict serum.

The lack of any appreciable protective effect of addict serum greater than that of nonaddict serum is further shown by the fact that there is practically no difference in the effect of the two kinds of sera on the length of the period of survival following the injection of minimal fatal doses of these alkaloidal salts. The results of tests of this nature carried out with heroin addict serum and heroin hydrochloride are given in Table 5. In Group I of this series of experiments the average length of the period of survival of the mice which died following the injection of heroin addict serum and a minimal fatal dose of heroin hydrochloride was 1 hour 34 minutes; for the controls, using nonaddict serum, it was 1 hour 24 minutes. In Group II the average length of the period was 1 hour 9 minutes for the mice which received addict serum and 1 hour 17 minutes for the controls.

TABLE 5.—*Effect of heroin addict serum on the length of the period of survival following a minimal fatal dose of heroin hydrochloride*

Number of mouse	Length of period of survival following an injection of heroin addict serum and a minimal fatal dose of heroin hydrochloride			
	Group I	Control I	Group II	Control II
1.	hrs. mins. 0 35	hrs. min Survived.	hrs. mins. Survived.	hrs. mins. 1 49
2.	2 32	1 42	do	Survived.
3.	1 23	1 48	1 26	0 47
4.	Survived.	0 30	1 33	Survived.
5.	0 56	2 4	Survived.	1 21
6.	1 53	1 19	0 48	Survived.
7.	2 7	1 4	0 48	Do.
8.	Survived.	1 20	Survived.	Do.
9.	do	Survived.	do	Do.
10.	do	do	do	1 11

Group I: Received 0.5 c. c. of heroin addict serum subcutaneously. One hour later, 0.2 mg. per gm. of heroin in aqueous solution (1 c. c. = 10 mgs. heroin HCl) subcutaneously.

Control I: Received the same as Group I, the addict serum being replaced by the serum of a nonaddict.

Group II: 16 c. c. of heroin addict serum + 8 c. c. of heroin HCl solution (1 c. c. = mgs. of heroin HCl) were incubated for one hour at 37°. Of this mixture, a quantity equivalent to 0.2 mg. of heroin HCl per gm. of mouse was injected subcutaneously.

Control II: Received the same as Group II, the addict serum being replaced by the serum of a nonaddict.

The results of the foregoing tests are in accord with those reported for morphine by the second group of investigators named in the forepart of this paper. Taken together, it would seem that they constitute sufficient evidence upon which to base the claim that the blood of morphine and heroin addicts does not contain transferable immunizing substances. However, it may be contended that this conclusion is erroneous on the ground that it is impossible to establish accurately minimum lethal doses for these substances, owing to the wide variation in the resistance of different lots of mice, as well as of the individuals of any given lot, and because the same conditions were not always observed with respect to the concentration and amount of liquid injected. That this contention is not warranted is proved

by the results obtained in a second group of experiments carried out, the report of which follows:

EXPERIMENTS: GROUP II

In this group of experiments the necessity for establishing the minimal lethal doses of the drugs of addiction was avoided. The effect of addict serum was checked against that of the serum of healthy persons known to be nonaddicts, beginning with a sublethal dose of drug and ending with a surely fatal dose. The controls were run under exactly the same conditions as the addict serum tests and at about the same time. In all, 11 series of tests of this nature were carried out, typical results of which are presented in the tables below:

These results show that addict serum, administered as such or in different dilutions, does not affect the death rate or the period of survival of mice to which toxic doses of the drugs of addiction have been administered, any differently than does the serum of nonaddicts. Of the 36 mice which received morphine addict serum and morphine sulphate, 24 died; of the 36 controls, 24 died. Of the 52 mice which received heroin addict serum and heroin hydrochloride, 35 died; of the controls, 36 died. The average length of the period of survival of the mice which died after receiving morphine addict serum and morphine sulphate was 1 hour and 31 minutes. The average length of the period of survival of the controls which receive nonaddict serum in place of addict serum was 1 hour and 37 minutes. In the case of the mice which received heroin addict serum and heroin hydrochloride the average length of the period of survival was 1 hour and 30 minutes, and of the controls 1 hour and 28 minutes.

The results of tests in which the dosage of drug given was so small that none of the mice in either the addict serum group or the controls died, are not recorded in the tables, since they show nothing which might be used as a basis for determining differences in the effects of the two types of sera.

TABLE 6.—*Effect of the blood serum of morphine addicts on the death rate for toxic doses of morphine sulphate*

Series	Mouse		Dose of morphine sulphate		Time of injection	Time of death
	Number	Weight in grams	Mg. per gram	C. c. of mixture		
A (received morphine addict serum)	1	15.5	.40	.62	11.33 a. m.	Survived.
	2	16.1	.40	.64	11.34 a. m.	Do.
	3	16.0	.40	.64	11.35 a. m.	Do.
	4	17.2	.40	.69	11.36 a. m.	Do.
	1	19.6	.45	.88	11.37 a. m.	1.37 p. m.
	2	16.6	.45	.75	11.38 a. m.	1.00 p. m.
	3	16.3	.45	.73	11.39 a. m.	Survived.
	4	16.7	.45	.75	11.40 a. m.	Do.
	1	19.6	.50	.98	11.41 a. m.	12.49 p. m.
	2	19.5	.50	.98	11.42 a. m.	Survived.
	3	18.6	.50	.93	11.43 a. m.	Do.
	4	17.8	.50	.89	11.44 a. m.	1.30 p. m.
	1	18.6	.60	1.12	11.45 a. m.	1.10 p. m.
	2	18.7	.60	1.12	11.46 a. m.	1.48 p. m.
	3	15.8	.60	.95	11.47 a. m.	1.00 p. m.
	4	14.0	.60	.84	11.48 a. m.	1.35 p. m.
Control (received nonaddict serum)	1	12.9	.65	.84	11.49 a. m.	12.50 p. m.
	2	16.6	.65	1.08	11.50 a. m.	12.35 p. m.
	3	17.0	.65	1.12	11.51 a. m.	12.30 p. m.
	4	16.0	.65	1.04	11.52 a. m.	12.35 p. m.
	1	19.1	.40	.76	11.57 a. m.	Survived.
	2	14.7	.40	.59	11.58 a. m.	Do.
	3	14.8	.40	.59	11.58 a. m.	Do.
	4	14.7	.40	.59	11.59 a. m.	1.30 p. m.
	1	16.7	.45	.75	12.00 p. m.	1.49 p. m.
	2	16.3	.45	.73	12.01 p. m.	Survived.
	3	18.5	.45	.83	12.02 p. m.	Do.
	4	16.3	.45	.73	12.03 p. m.	1.54 p. m.
	1	16.5	.50	.83	12.04 p. m.	Survived.
	2	18.2	.50	.91	12.05 p. m.	Do.
	3	16.8	.50	.84	12.06 p. m.	1.15 p. m.
	4	16.4	.50	.82	12.07 p. m.	1.28 p. m.
	1	19.4	.60	1.16	12.08 p. m.	Survived.
	2	16.2	.60	.97	12.10 p. m.	2.05 p. m.
	3	18.2	.60	1.09	12.11 p. m.	1.53 p. m.
	4	14.6	.60	.88	12.13 p. m.	1.35 p. m.
	1	19.5	.65	1.27	12.14 p. m.	1.25 p. m.
	2	17.2	.65	1.12	12.15 p. m.	1.20 p. m.
	3	18.2	.65	1.18	12.16 p. m.	1.05 p. m.
	4	19.9	.65	1.29	12.17 p. m.	1.40 p. m.

B: 0.3 gm. of morphine SO₄ was dissolved in 15 c. c. of distilled water and mixed with 15 c. c. of the serum of a morphine addict. The mixture was incubated for 1 hour at 37° C.

The serum was obtained from the blood of a person addicted to morphine for 10 years. Up to the time of entering the hospital, he was taking hypodermically 8 grains of morphine sulphate daily. The blood was drawn 48 hours after the last dose of morphine had been given.

Control: Same as B, except that the serum used was obtained from the blood of a nonaddict.

TABLE 7.—*Effect of the blood serum of morphine addicts on the death rate for toxic doses of morphine sulphate*

Series	Mouse		Dose of morphine sulphate		Time of injection	Time of death
	No.	Weight in grams	Mg. per gram	C. c. of mixture		
B (received morphine addict serum) ----	1	17.0	.45	.77	10.18	12.45 p. m.
	2	14.1	.45	.63	10.19	Survived.
	3	17.8	.45	.80	10.20	1.07 p. m.
	4	13.2	.45	.59	10.21	Survived.
	1	15.3	.50	.77	10.22	11.46 a. m.
	2	16.3	.50	.82	10.23	11.40 a. m.
	3	16.7	.50	.84	10.24	12.10 p. m.
	4	17.0	.50	.85	10.25	Survived.
	1	12.7	.60	.76	10.26	11.35 a. m.
	2	12.5	.60	.81	10.27	11.40 a. m.
	3	19.8	.60	1.24	10.29	Survived.
	4	18.4	.60	1.10	10.30	12.10 p. m.
Control (received nonaddict serum)-----	1	13.1	.45	.59	9.48	11.45 a. m.
	2	16.5	.45	.74	9.50	Survived.
	3	17.0	.45	.77	9.51	Do.
	4	16.2	.45	.73	9.52	12.05 p. m.
	1	18.1	.50	.91	9.53	11.15 a. m.
	2	18.5	.50	.93	9.54	Survived.
	3	18.2	.50	.91	9.55	Do.
	4	15.1	.50	.76	9.56	11.47 a. m.
	1	18.0	.60	1.08	9.57	11.37 a. m.
	2	19.9	.60	1.19	9.58	12.20 a. m.
	3	16.2	.60	.97	9.59	11.50 a. m.
	4	15.8	.60	.95	10.00	11.05 a. m.
	1	15.4	.70	1.08	10.01	10.25 a. m.
	2	12.9	.70	.90	10.02	11.50 a. m.
	3	13.7	.70	.96	10.03	10.46 a. m.
	4	16.2	.70	1.13	10.04	11.45 a. m.

A: 0.4 gm. of morphine SO₄ was dissolved in 36 c. c. of distilled water and mixed with 4 c. c. of the serum of a morphine addict. The mixture was incubated for 1 hour at 37°.

The serum was obtained from the blood of a male addict who had been addicted to morphine for about nine years. The blood was drawn 24 hours after this patient had received his last dose of the drug and when pronounced symptoms of suffering were evident.

Control: The same as A, except that the serum used was obtained from the blood of a nonaddict.

TABLE 8.—*Effect of the blood serum of heroin addicts on the death rate for toxic doses of heroin hydrochloride*

Series	Mouse		Dose of heroin hydrochloride		Time of injection	Time of death
	No.	Weight in grams	Mg. per gram	C. e. of mixture		
C (received heroin addict serum).	1	20.5	.15	.61	11.14 a. m.	Survived.
	2	15.5	.15	.46	11.15 a. m.	Do.
	3	13.4	.15	.40	11.16 a. m.	Do.
	4	14.6	.15	.44	11.17 a. m.	Do.
	1	18.4	.20	.64	11.18 a. m.	Do.
	2	19.5	.20	.78	11.19 a. m.	12.10 p. m.
	3	16.0	.20	.64	11.20 a. m.	Survived.
	4	16.9	.20	.68	11.21 a. m.	Do.
	1	17.8	.25	.89	11.22 a. m.	11.31 a. m.
	2	17.0	.25	.85	11.23 a. m.	Survived.
	3	11.1	.25	.55	11.24 a. m.	11.10 a. m.
	4	14.0	.25	.70	11.25 a. m.	Survived.
	1	16.4	.30	.98	11.26 a. m.	11.57 a. m.
	2	20.9	.30	1.25	11.27 a. m.	12.22 p. m.
	3	9.5	.30	.57	11.28 a. m.	12.05 p. m.
	4	12.5	.30	.75	11.29 a. m.	12.25 p. m.
Control (received nonaddict serum).	1	13.0	.35	.91	11.31 a. m.	12.05 p. m.
	2	15.0	.35	1.05	11.32 a. m.	12.06 p. m.
	3	15.6	.35	1.09	11.33 a. m.	12.02 p. m.
	4	14.2	.35	.99	11.35 a. m.	12.52 p. m.
	1	16.6	.15	.50	11.42 a. m.	Survived.
	2	15.5	.15	.47	11.43 a. m.	12.08 p. m.
	3	15.1	.15	.45	11.44 a. m.	Survived.
	4	16.1	.15	.48	11.45 a. m.	Do.
	1	16.3	.20	.65	11.46 a. m.	12.48 p. m.
	2	17.0	.20	.68	11.47 a. m.	Survived.
	3	20.2	.20	.81	11.48 a. m.	Do.
	4	13.2	.20	.53	11.49 a. m.	11.15 p. m.
	1	16.9	.25	.84	11.50 a. m.	12.30 p. m.
	2	17.4	.25	.87	11.51 a. m.	11.10 p. m.
	3	14.2	.25	.71	11.52 a. m.	Survived.
	4	22.8	.25	1.14	11.53 a. m.	12.37 p. m.
	1	13.9	.30	.83	11.56 a. m.	12.39 p. m.
	2	13.9	.30	.83	11.57 a. m.	12.43 p. m.
	3	16.6	.30	.99	11.58 a. m.	Survived.
	4	13.1	.30	.78	11.59 a. m.	12.33 p. m.
	1	15.1	.35	1.06	12.00 p. m.	12.35 p. m.
	2	16.0	.35	1.12	12.01 p. m.	12.35 p. m.
	3	18.2	.35	1.27	12.02 p. m.	12.46 p. m.
	4	19.0	.35	1.33	12.03 p. m.	12.47 p. m.

C: 0.175 gm. of heroin HCl was dissolved in 30 c. c. of normal salt solution and mixed with 5 c. c. of heroin addict serum. The mixture was incubated for 1 hour at 37°.

The serum was obtained from the blood of a person who had been addicted to morphine and heroin for about 12 years. Just previous to entering the hospital, heroin was the drug used. The blood was drawn 48 hours after the last dose of opiate had been given.

Control: Same as C. except that the serum used was obtained from the blood of a nonaddict.

TABLE 9.—*Effect of the blood serum of heroin addicts on the death rate for toxic doses of heroin hydrochloride*

Series	Mouse		Dose of heroin hydrochloride		Time of injection	Time of death
	No.	Weight in grams	Mgs. per gram	C. c. of mixture		
D (received heroin addict serum).	1	15.1	0.20	0.60	11.35 a. m.	12.25 p. m.
	2	16.2	.20	.65	11.36 a. m.	12.20 p. m.
	3	22.7	.20	.91	11.37 a. m.	12.35 p. m.
	4	13.8	.20	.55	11.38 a. m.	Survived.
	1	24.0	.25	1.20	11.39 a. m.	11.15 p. m.
	2	12.7	.25	.63	11.40 a. m.	12.35 p. m.
	3	17.0	.25	.85	11.41 a. m.	Survived.
	4	14.3	.25	.72	11.42 a. m.	12.45 p. m.
	1	13.7	.275	.75	11.43 a. m.	12.36 p. m.
	2	13.3	.275	.73	11.44 a. m.	12.30 p. m.
	3	16.2	.275	.89	11.45 a. m.	Survived.
	4	21.9	.275	1.20	11.46 a. m.	12.35 p. m.
	1	21.7	.30	1.30	11.48 a. m.	12.20 p. m.
	2	16.8	.30	1.00	11.49 a. m.	12.37 p. m.
	3	20.3	.30	1.22	11.50 a. m.	12.29 p. m.
	4	14.8	.30	.69	11.51 a. m.	12.42 p. m.
Control (received nonaddict serum).	1	23.2	.20	.93	12.00 p. m.	Survived.
	2	21.0	.20	.84	12.01 p. m.	12.39 p. m.
	3	19.7	.20	.79	12.02 p. m.	1.45 p. m.
	4	17.7	.20	.71	12.03 p. m.	Survived.
	1	10.8	.25	.99	12.04 p. m.	1.36 p. m.
	2	13.8	.25	.69	12.05 p. m.	Survived.
	3	17.7	.25	.88	12.06 p. m.	12.58 p. m.
	4	17.3	.25	.86	12.07 p. m.	12.55 p. m.
	1	24.5	.275	1.35	12.09 p. m.	12.45 p. m.
	2	14.4	.275	.79	12.10 p. m.	1.10 p. m.
	3	10.1	.275	.56	12.11 p. m.	Survived.
	4	12.9	.275	.71	12.12 p. m.	12.52 p. m.
	1	16.3	.30	.98	12.13 p. m.	12.50 p. m.
	2	12.1	.30	.73	12.14 p. m.	12.59 p. m.
	3	19.6	.30	1.18	12.15 p. m.	1.00 p. m.
	4	12.9	.30	.77	12.16 p. m.	12.42 p. m.

D: 0.15 gm. of heroin HCl was dissolved in 15 c. c. of normal salt solution and mixed with 15 c. c. of serum. The mixture was incubated for 1 hour at 37°.

The serum was obtained from a person who had been addicted to morphine and heroin for a period of eight years. On entering the hospital this person was taking hypodermically 24 grains of heroin HCl per day. The blood was drawn 4 days after the last dose of heroin and 48 hours after the last opiate (codeine) was given.

Control: The same as D, except that the serum was obtained from the blood of a nonaddict.

TABLE 10.—*Effect of the blood serum of heroin addicts on the death rate for toxic doses of heroin hydrochloride*

Series	Mouse		Dose of heroin hydrochloride		Time of injection	Time of death
	No.	Weight in grams	Mgs. per gram	C. c. of mixture		
E (received heroin addict serum).	1	16.5	.225	.74	11.35 a. m.	Survived.
	2	16.4	.225	.74	11.36 a. m.	Do.
	3	12.0	.225	.54	11.37 a. m.	3.20 p. m.
	4	14.2	.225	.64	11.38 a. m.	3.30 p. m.
	1	19.0	.25	.95	11.40 a. m.	Survived.
	2	17.7	.25	.88	11.41 a. m.	Do.
	3	16.3	.25	.81	11.42 a. m.	2.12 p. m.
	4	15.9	.25	.79	11.43 a. m.	2.45 p. m.
	1	16.5	.275	.90	11.45 a. m.	Survived.
	2	14.2	.275	.78	11.46 a. m.	2.32 p. m.
	3	15.7	.275	.86	11.47 a. m.	3.00 p. m.
	4	16.1	.275	.88	11.48 a. m.	2.33 p. m.
	1	15.5	.30	.93	11.51 a. m.	2.22 p. m.
	2	17.9	.30	1.07	11.52 a. m.	2.35 p. m.
	3	16.3	.30	.98	11.53 a. m.	2.17 p. m.
	4	17.1	.30	1.03	11.54 a. m.	1.52 p. m.
Control (received nonaddict serum).	1	16.5	.225	.74	11.25 a. m.	2.22 p. m.
	2	15.6	.225	.70	11.26 a. m.	Survived.
	3	20.6	.225	.81	11.27 a. m.	3.00 p. m.
	4	14.6	.225	.66	11.29 a. m.	Survived.
	1	14.5	.25	.72	11.30 a. m.	2.32 p. m.
	2	16.5	.25	.82	11.31 a. m.	Survived.
	3	12.6	.25	.62	11.32 a. m.	Do.
	4	17.5	.25	.87	11.34 a. m.	2.50 p. m.
	1	16.8	.275	.92	11.35 a. m.	2.55 p. m.
	2	16.8	.275	.92	11.36 a. m.	2.20 p. m.
	3	16.7	.275	.91	11.37 a. m.	1.47 p. m.
	4	15.1	.275	.83	11.38 a. m.	Survived.
	1	16.4	.30	.98	11.39 a. m.	1.48 p. m.
	2	13.8	.30	.81	11.40 a. m.	2.00 p. m.
	3	18.2	.30	1.09	11.41 a. m.	2.48 p. m.
	4	17.0	.30	1.02	11.42 a. m.	2.35 p. m.

E: 0.10 gm. of heroin HCl was dissolved in 20 c. c. of the blood serum of a heroin addict and the solution was incubated for 1 hour at 37°.

The addict from which this serum was obtained had been addicted to opiates for 20 years. For 3 years prior to his admission to the hospital he had been taking hypodermically 20 grains of heroin HCl daily. The blood was drawn 48 hours after he had received his last dose of heroin and 24 hours after the last opiate.

Control: The same as E, except the serum used was obtained from the blood of a nonaddict.

CONCLUSIONS

Both groups of results presented above fail to show that the effect of subcutaneous injections of morphine and heroin addict blood sera into mice receiving lethal doses of the respective drugs of addiction differs from that produced by the injection of non-addict sera—a slight protective action being observed in both cases, as has been discussed. It is therefore concluded that the blood of human beings addicted to these drugs does not contain transferable immunizing substances.

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(5) Cloetta: Arch. f. exper. Path. u. Pharmakol. (1903), vol. 50, p. 453.
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TETANUS FROM VACCINATION DRESSINGS

The United States Public Health Service issues a warning to the medical profession and to the public against the use of bunion pads as a dressing in vaccination against smallpox.

This singular use of bunion pads appears to be more common than would be supposed. Several fatal cases of tetanus following their use have recently occurred in the United States, and laboratory tests have demonstrated the presence of tetanus spores in bunion pads from the same source as those which were associated with tetanus cases.

The Public Health Service deprecates the use of any kind of a shield as a vaccination dressing. The employment of such a shield tends to prevent evaporation, to retain heat, moisture, or discharges, with a consequent softening of the vesicle, to obstruct lymphatic drainage, to produce hyperemia, and to create conditions apparently favorable for the development of bacterial invasion, especially by the tetanus organism.

The smallest single site insertion compatible with a successful take and with no immediate dressing whatever is believed to be the best method of vaccination in the majority of cases.

DEATH RATES IN A GROUP OF INSURED PERSONS

COMPARISON OF PRINCIPAL CAUSES OF DEATH, JANUARY, 1925, AND JANUARY, DECEMBER, AND YEAR, 1924

The accompanying table is taken from the Statistical Bulletin for February, 1925, published by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company for January, 1925, as compared with December, 1924, and January and year, 1924. The rates for January, 1925, are based on a strength of approximately 16,000,000 insured persons in the United States and Canada.

The January death rate of 9.5 per 1,000, as compared with 10 in 1924, is stated to be the lowest January rate on record for this group of persons. For some reason, however, this favorable comparison does not hold for the large cities of the United States, the general death rate for which, as reported by the Bureau of the Census, is given as 14.4 per 1,000 for January, 1925, in comparison with 13.5 for January, 1924, and 13.2 for December, 1924.

The table shows declines from the rates for January, 1924, for all the principal diseases of childhood, the measles death rate being about one-fourth that of a year ago, and the diphtheria rate showing a decline of 23 per cent. The pneumonia rate shows a slight decline, despite the inclusion of a large number of infant lives in 1925; and fewer deaths were also recorded from cancer, cerebral hemorrhage, Bright's disease, and puerperal conditions. The outstanding feature in the comparison with January, 1924, is the reduction in the death rate from tuberculosis from 110 per 100,000 a year ago to 96.1 this year.

Influenza was more prevalent than during January, 1924; and diabetes and organic heart diseases show higher rates this year.

Death rates (annual basis) for principal causes per 1,000 lives exposed, January, 1925, and December, January, and year, 1924

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	Death rate per 100,000 lives exposed ¹			
	January, 1925	Decem- ber, 1924	January, 1924	Year 1924 ²
Total, all causes	952.6	954.0	908.1	907.5
Typhoid fever	4.4	4.2	3.0	4.4
Measles	2.3	1.6	8.8	7.2
Scarlet fever	5.1	3.8	7.0	4.4
Whooping cough	5.1	5.3	5.9	7.4
Diphtheria	15.8	14.3	20.4	13.2
Influenza	25.1	19.6	16.6	16.0
Tuberculosis (all forms)	96.1	97.5	110.0	104.5
Tuberculosis of respiratory system	84.8	86.2	100.2	92.6
Cancer	70.7	71.2	74.3	70.4
Diabetes mellitus	19.1	16.5	17.6	14.9
Cerebral hemorrhage	58.5	64.4	67.7	60.2
Organic diseases of heart	143.2	142.9	139.7	123.7
Pneumonia (all forms)	125.4	105.5	126.0	88.8
Other respiratory diseases	16.8	18.4	16.1	13.9
Diarrhea and enteritis	17.0	21.1	18.3	32.2
Bright's disease (chronic nephritis)	70.3	71.1	73.3	65.5
Puerperal state	14.4	15.6	17.2	16.8
Suicides	5.7	7.6	5.6	7.2
Homicides	6.6	7.8	5.7	7.1
Other external causes (excluding suicides and homicides)	59.2	64.3	64.0	62.7
Traumatism by automobile	11.0	17.5	13.2	15.7
All other causes	192.0	201.2	200.8	187.0

¹ All figures include infants insured under one year of age.

² Based on provisional estimate of lives exposed to risk in 1924.

PERCENTAGE OF DISBURSEMENTS FOR PRINCIPAL CAUSES OF DEATH IN 1924

The following table, taken from the Bulletin for February, 1925, shows the percentages of the total amount paid in death claims in 1924 on account of deaths from specified diseases and conditions.

For the first time, it is stated, the amount disbursed on account of deaths from heart disease (approximately one-seventh of the total) exceeded that for any other disease. The three principal cardiovascular-renal impairments (heart disease, cerebral hemorrhage, and chronic nephritis) were responsible for 27.1 per cent of the total claims paid.

*Per cent disbursed on account of deaths from specified diseases and conditions—
Entire experience Metropolitan Life Insurance Co., 1924*

Disease or condition	Per cent of total	
	1924	1925
Diseases of the heart	13.5	12.7
Tuberculosis (all forms)	12.3	12.8
Tuberculosis of the respiratory system	11.4	12.0
Influenza and pneumonia	9.5	11.5
Influenza	1.7	3.4
Pneumonia (all forms)	7.7	8.1
Cancer (all forms)	9.4	8.8
Chronic nephritis	7.0	7.0
Cerebral hemorrhage	6.6	6.8
Puerperal state	1.7	1.7
Typhoid fever	.7	.7
Total external causes	12.3	11.8
Suicides	2.1	2.1
Homicides	1.2	1.2
Accidents	9.0	8.4
Accidental drowning	.9	.9
Traumatism by fall	1.1	.9
Railroad accidents	.9	1.0
Automobile accidents	1.9	1.9
Other accidents	4.2	3.8
All other causes of death	26.9	26.2

Examination for Entrance into the Regular Corps of the United States Public Health Service

Examinations of candidates for entrance into the Regular Corps of the United States Public Health Service will be held at the following-named places on the dates specified:

Washington, D. C., June 1, 1925.

Chicago, Ill., June 1, 1925.

New Orleans, La., June 1, 1925.

San Francisco, Calif., June 1, 1925.

Candidates must be not less than 23 nor more than 32 years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily oral, written, and clinical tests before a board of medical officers and undergo a physical examination.

Successful candidates will be recommended for appointment by the President with the advice and consent of the Senate.

Requests for information or permission to take this examination should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C.

DEATHS DURING WEEK ENDED MARCH 7, 1925

Summary of information received by telegraph from industrial insurance companies for week ended March 7, 1925, and corresponding week of 1924. (From the Weekly Health Index, March 10, 1925, issued by the Bureau of the Census, Department of Commerce)

	Week ended Mar. 7, 1925	Corresponding week, 1924
Policies in force	58,897,864	55,215,882
Number of death claims	12,497	11,793
Death claims per 1,000 policies in force, annual rate	11.1	11.1

Deaths from all causes in certain large cities of the United States during the week ended March 7, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, March 10, 1925, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Mar. 7, 1925		Annual death rate per 1,000 corre- sponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended Mar. 7, 1925 ²
	Total deaths	Death rate ¹		Week ended Mar. 7, 1925	Corre- sponding week, 1924	
Total (64 cities)	7,643	14.5	15.0	889	948	-----
Akron	39	-----	-----	7	7	77
Albany ⁴	40	17.4	18.9	4	7	89
Atlanta	77	17.3	24.0	5	13	-----
Baltimore ⁴	258	16.9	17.2	24	33	70
Birmingham	65	16.5	19.0	8	12	-----
Boston	282	18.8	16.1	35	24	93
Bridgeport	50	-----	-----	6	5	95
Buffalo	165	15.5	12.9	29	19	118
Cambridge	43	19.9	14.4	9	3	155
Camden	38	15.4	17.3	8	8	131
Chicago ⁴	818	14.2	13.5	115	107	102
Cincinnati	135	17.2	15.2	7	14	41
Cleveland	214	11.9	11.1	20	28	80
Columbus	82	15.6	15.4	11	8	103
Dallas	61	16.4	17.5	8	8	-----
Dayton	35	10.6	9.6	3	3	48
Denver	76	-----	-----	10	14	-----
Des Moines	39	13.6	17.6	2	6	34
Detroit	322	-----	-----	62	55	105
Duluth	13	6.1	7.2	2	2	42
Erie	27	-----	-----	2	8	39
Fall River ⁴	38	16.4	16.4	8	7	115
Flint	14	-----	-----	3	9	49
Fort Worth	32	10.9	8.8	5	2	-----
Grand Rapids	39	13.5	13.4	3	7	47
Houston	53	-----	-----	8	3	-----
Indianapolis	108	15.7	15.6	14	14	96
Jacksonville, Fla.	40	19.9	15.8	6	5	133
Jersey City	85	14.1	15.4	8	9	56
Kansas City, Kans.	47	19.8	15.0	9	4	190
Kansas City, Mo.	125	17.7	13.2	16	6	-----
Los Angeles	256	-----	-----	26	32	72
Louisville	107	21.5	19.6	9	7	79
Lowell	38	17.0	9.5	10	4	174
Lynn	28	13.9	12.6	7	6	186
Memphis	71	21.2	24.5	8	4	-----
Milwaukee	139	14.4	10.7	19	16	87
Minneapolis	127	15.6	12.0	19	10	102
Nashville ⁴	57	23.9	26.6	7	8	-----
New Bedford	32	12.3	11.4	6	9	100
New Haven	44	12.8	15.1	8	5	103
New Orleans	147	18.5	22.7	9	11	-----
New York	1,531	13.1	14.9	155	219	62
Bronx Borough	171	9.9	10.1	15	15	52
Brooklyn Borough	507	11.8	13.1	56	75	59
Manhattan Borough	669	15.5	19.0	72	112	72
Queens Borough	115	10.4	10.6	8	12	40
Richmond Borough	69	26.9	22.7	4	5	72
Newark, N. J.	117	13.5	14.2	10	18	46
Norfolk	40	12.3	11.4	3	3	53
Oakland	44	9.0	13.3	7	11	82

Deaths from all causes in certain large cities of the United States during the week ended March 7, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, March 10, 1925, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Mar. 7, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended Mar. 7, 1925 ²
	Total deaths	Death rate ¹		Week ended Mar. 7, 1925	Corresponding week, 1924	
Oklahoma City	27	13.2	17.5	3	3	—
Omaha	55	13.5	12.0	8	5	77
Paterson	26	9.6	13.7	1	5	17
Philadelphia	498	13.1	15.7	55	64	69
Pittsburgh	167	13.8	22.8	14	40	49
Portland, Oreg.	78	14.4	13.7	8	6	83
Providence	65	13.8	18.8	9	13	72
Richmond	65	18.2	20.4	6	8	73
Rochester	86	13.5	—	12	—	95
St. Louis	248	15.7	14.1	18	24	—
St. Paul	69	14.6	14.5	8	5	63
Salt Lake City ³	30	12.0	10.1	1	1	16
San Antonio	58	15.3	17.4	6	13	—
San Francisco	126	11.8	14.0	14	10	81
Schenectady	23	11.7	16.1	5	3	141
Seattle	62	—	—	6	4	61
Somerville	31	15.8	11.9	6	3	161
Spokane	26	—	—	3	3	65
Springfield, Mass.	41	14.0	13.7	6	6	89
Syracuse	55	15.0	13.0	6	6	75
Tacoma	28	14.0	11.1	4	0	95
Toledo	84	15.2	14.3	16	5	145
Trenton	44	17.4	15.7	9	7	146
Washington, D. C.	179	18.7	17.5	23	17	129
Waterbury	25	—	—	5	5	111
Wilmington, Del.	34	14.5	16.1	6	7	137
Worcester	65	17.0	16.0	5	9	58
Yonkers	19	8.9	12.4	0	5	0
Youngstown	41	13.4	6.0	4	3	51

¹ Annual rate per 1,000 population.

² Deaths under 1 year per 1,000 births—an annual rate based on death under 1 year for the week and estimated births for 1924. Cities left blank are not in the registration area for births.

³ Data for 63 cities.

⁴ Deaths for week ended Friday, Mar. 6, 1925.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Week Ended March 14, 1925

ALABAMA		ARKANSAS—continued	
	Cases		Cases
Cerebrospinal meningitis	2	Ophthalmia neonatorum	1
Chicken pox	32	Pellagra	3
Diphtheria	9	Scarlet fever	4
Dysentery	5	Smallpox	4
Influenza	619	Trachoma	3
Lethargic encephalitis	1	Tuberculosis	11
Malaria	51	Typhoid fever	8
Measles	34	Whooping cough	37
Mumps	63		
Ophthalmia neonatorum	3		
Pellagra	10		
Pneumonia	173		
Poliomyelitis	1	CALIFORNIA	
Scarlet fever	36	Cerebrospinal meningitis—Pacific Grove	1
Smallpox	142	Diphtheria	130
Tuberculosis	40	Influenza	146
Typhoid fever	7	Jaundice (epidemic)—San Francisco	1
Whooping cough	7	Lethargic encephalitis:	
		Orange County	1
		San Diego	1
		Measles	60
		Poliomyelitis:	
		Berkeley	1
ARIZONA		Los Angeles	2
Chicken pox	8	Scarlet fever	161
Influenza	4	Smallpox:	
Measles	31	Los Angeles	44
Mumps	11	Oakland	10
Scarlet fever	2	San Diego	13
Smallpox	1	Scattering	60
Tuberculosis	2	Typhoid fever	7
Whooping cough	7		
ARKANSAS			
Chicken pox	33	COLORADO	
Diphtheria	3	(Exclusive of Denver)	
Hookworm disease	1	Chicken pox	21
Influenza	522	Diphtheria	5
Malaria	32	Influenza	5
Measles	26	Measles	3
Mumps	22	Mumps	23

COLORADO--continued		ILLINOIS--continued	
	Cases		Cases
Pneumonia	17	Scarlet fever	367
Scarlet fever	24	Cook County	8
Trachoma	1	Du Page County	12
Tuberculosis	41	Fulton County	8
Typhoid fever	1	Greene County	12
Whooping cough	20	Jefferson County	11
CONNECTICUT		Kane County	19
Chicken pox	55	Peoria County	8
Conjunctivitis (infectious)	4	Sangamon County	13
Diphtheria	48	Scattering	113
German measles	39	Smallpox	
Influenza	15	Douglas County	8
Lethargic encephalitis	1	Madison County	23
Malaria	1	Scattering	20
Measles	143	Tuberculosis	231
Mumps	55	Typhoid fever	17
Paratyphoid fever	2	Whooping cough	230
Pneumonia (all forms)	112	INDIANA	
Scarlet fever	152	Cerebrospinal meningitis	1
Septic sore throat	4	Chicken pox	73
Tuberculosis (all forms)	41	Diphtheria	34
Typhoid fever	2	Influenza	244
Whooping cough	61	Measles	109
DELAWARE		Mumps	9
Diphtheria	1	Pneumonia	53
Measles	1	Scarlet fever	181
Mumps	4	Smallpox	105
Pneumonia	2	Trachoma	1
Scarlet fever	7	Tuberculosis	34
Tuberculosis	6	Typhoid fever	3
Whooping cough	3	Whooping cough	35
GEORGIA		IOWA	
Cerebrospinal meningitis	1	Diphtheria	7
Chicken pox	42	Scarlet fever	35
Conjunctivitis	2	Smallpox	16
Diphtheria	53	Typhoid fever	1
Dysentery (amebic)	3	KANSAS	
Hookworm disease	4	Chicken pox	105
Influenza	1, 174	Diphtheria	27
Malaria	31	German measles	2
Measles	35	Influenza	101
Mumps	62	Lethargic encephalitis	1
Pellagra	8	Measles	8
Pneumonia	137	Mumps	448
Rabies	1	Pneumonia	86
Scarlet fever	4	Scarlet fever	133
Septic sore throat	5	Smallpox	5
Smallpox	16	Trachoma	1
Tuberculosis	26	Tuberculosis	38
Typhoid fever	7	Typhoid fever	3
Whooping cough	67	Whooping cough	21
ILLINOIS		LOUISIANA	
Cerebrospinal meningitis—Cook County	1	Diphtheria	33
Diphtheria:		Influenza	76
Cook County	75	Malaria	5
Scattering	31	Pneumonia	42
Influenza	90	Scarlet fever	19
Lethargic encephalitis—Cook County	2	Smallpox	29
Measles	962	Tuberculosis	32
Pneumonia	506	Typhoid fever	9
		Whooping cough	20

MAINE		MINNESOTA—continued	
	Cases		Cases
Chicken pox	64	Pneumonia	5
Conjunctivitis	1	Scarlet fever	226
Diphtheria	7	Smallpox	34
Influenza	98	Tuberculosis	61
Measles	24	Typhoid fever	12
Mumps	192	Whooping cough	21
Pneumonia	16		
Poliomyelitis	1	MISSISSIPPI	
Scarlet fever	27	Diphtheria	4
Tetanus	1	Influenza	729
Tuberculosis	22	Scarlet fever	4
Typhoid fever	2	Smallpox	11
Vincent's angina	3	Typhoid fever	4
Whooping cough	4		
MARYLAND ¹		MISSOURI	
Cerebrospinal meningitis	2	(Exclusive of Kansas City)	
Chicken pox	86	Chicken pox	54
Diphtheria	34	Diphtheria	58
German measles	2	Influenza	69
Influenza	75	Malaria	3
Lethargic encephalitis	1	Measles	11
Measles	36	Mumps	82
Mumps	67	Pneumonia	6
Pneumonia (all forms)	157	Scarlet fever	219
Scarlet fever	84	Smallpox	15
Tuberculosis	54	Trachoma	6
Typhoid fever	10	Tuberculosis	32
Whooping cough	130	Typhoid fever	10
		Whooping cough	13
MASSACHUSETTS		MONTANA	
Chicken pox	215	Chicken pox	8
Conjunctivitis (suppurative)	20	Diphtheria	9
Diphtheria	125	German measles	51
German measles	282	Measles	81
Hookworm disease	1	Mumps	4
Influenza	57	Poliomyelitis—Fairview	1
Lethargic encephalitis	3	Scarlet fever	19
Measles	597	Smallpox	5
Mumps	140	Tuberculosis	4
Ophthalmia neonatorum	40	Whooping cough	4
Pneumonia (lobar)	166		
Poliomyelitis	2	NEBRASKA	
Scarlet fever	375	Chicken pox	22
Septic sore throat	6	Diphtheria	7
Trachoma	2	Influenza	1
Tuberculosis (all forms)	185	Measles	4
Typhoid fever	8	Mumps	26
Whooping cough	130	Pneumonia	3
		Scarlet fever	11
MICHIGAN		Septic sore throat	
Diphtheria	75	Smallpox	1
Measles	207	Typhoid fever	18
Pneumonia	188	Whooping cough	2
Scarlet fever	415		
Smallpox	19	NEW JERSEY	
Tuberculosis	68	Cerebrospinal meningitis	4
Typhoid fever	12	Chicken pox	153
Whooping cough	75	Diphtheria	85
		Dysentery	7
MINNESOTA		Influenza	
Chicken pox	130	Measles	42
Diphtheria	64	Pneumonia	230
Influenza	3	Poliomyelitis	163
Lethargic encephalitis	1	Scarlet fever	2
Measles	61	Smallpox	407
		Trachoma	9

¹ Week ended Friday.

NEW MEXICO		OREGON—continued																																																																																																																																																																											
	Cases		Cases																																																																																																																																																																										
Chicken pox	18	Scarlet fever:																																																																																																																																																																											
Diphtheria	29	Wasco County	8																																																																																																																																																																										
German measles	4	Scattering	21																																																																																																																																																																										
Influenza	5	Septic sore throat	1																																																																																																																																																																										
Measles	114	Smallpox:																																																																																																																																																																											
Mumps	20	Portland	20																																																																																																																																																																										
Pneumonia	15	Scattering	8																																																																																																																																																																										
Scarlet fever	10	Tuberculosis	17																																																																																																																																																																										
Tuberculosis	12	Typhoid fever	2																																																																																																																																																																										
Typhoid fever	1	Whooping cough	7																																																																																																																																																																										
Whooping cough	1																																																																																																																																																																												
NEW YORK		SOUTH DAKOTA																																																																																																																																																																											
(Exclusive of New York City)																																																																																																																																																																													
Cerebrospinal meningitis	1	Chicken pox	1																																																																																																																																																																										
Diphtheria	90	Diphtheria	3																																																																																																																																																																										
Influenza	110	Mumps	1																																																																																																																																																																										
Lethargic encephalitis	2	Pneumonia	2																																																																																																																																																																										
Measles	410	Scarlet fever	34																																																																																																																																																																										
Pneumonia	302	Smallpox	11																																																																																																																																																																										
Poliomyelitis	2	Typhoid fever	1																																																																																																																																																																										
Scarlet fever	394	Whooping cough	1																																																																																																																																																																										
Smallpox	9																																																																																																																																																																												
Typhoid fever	11																																																																																																																																																																												
Whooping cough	246																																																																																																																																																																												
NORTH CAROLINA		TEXAS																																																																																																																																																																											
Cerebrospinal meningitis	1	Cerebrospinal meningitis	2																																																																																																																																																																										
Chicken pox	95	Chicken pox	90																																																																																																																																																																										
Diphtheria	26	Diphtheria	46																																																																																																																																																																										
German measles	1	Influenza	388																																																																																																																																																																										
Measles	53	Lethargic encephalitis	1																																																																																																																																																																										
Scarlet fever	28	Measles	42																																																																																																																																																																										
Smallpox	53	Mumps	52																																																																																																																																																																										
Typhoid fever	2	Ophthalmia neonatorum	1																																																																																																																																																																										
Whooping cough	95	Paratyphoid fever	1																																																																																																																																																																										
OKLAHOMA				Pellagra	4	(Exclusive of Oklahoma City and Tulsa)		Pneumonia	61	Cerebrospinal meningitis—Haskell	1	Scarlet fever	28	Chicken pox	17	Smallpox	62	Diphtheria	8	Tetanus	7	Influenza	258	Tuberculosis	30	Measles	6	Typhoid fever	4	Mumps	16	Whooping cough	63	Pneumonia	99			Scarlet fever	5			Smallpox	15			Typhoid fever	11			Whooping cough	18			OREGON		VERMONT		Cerebrospinal meningitis	2	Chicken pox	31	Chicken pox	36	Measles	1	Diphtheria:		Mumps	83	Portland	11	Scarlet fever	23	Scattering	12	Typhoid fever	2	Influenza	31	Whooping cough	10	Measles	6			Mumps	16			Pneumonia	99			Scarlet fever	5			Smallpox	15			Typhoid fever	11			Whooping cough	18			WASHINGTON		WASHINGTON		Cerebrospinal meningitis	2	Chicken pox	113	Chicken pox	36	Diphtheria	43	Diphtheria:		German measles	74	Portland	11	Measles	13	Scattering	12	Mumps	201	Influenza	31	Pneumonia	2	Measles	6	Scarlet fever	46	Mumps	26	Smallpox	38	Pneumonia	10	Tuberculosis	31			Typhoid fever	6			Whooping cough	70	WEST VIRGINIA		Diphtheria	7			Scarlet fever	8			Smallpox	10			Typhoid fever	2
		Pellagra	4																																																																																																																																																																										
(Exclusive of Oklahoma City and Tulsa)		Pneumonia	61																																																																																																																																																																										
Cerebrospinal meningitis—Haskell	1	Scarlet fever	28																																																																																																																																																																										
Chicken pox	17	Smallpox	62																																																																																																																																																																										
Diphtheria	8	Tetanus	7																																																																																																																																																																										
Influenza	258	Tuberculosis	30																																																																																																																																																																										
Measles	6	Typhoid fever	4																																																																																																																																																																										
Mumps	16	Whooping cough	63																																																																																																																																																																										
Pneumonia	99																																																																																																																																																																												
Scarlet fever	5																																																																																																																																																																												
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Whooping cough	18																																																																																																																																																																												
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Cerebrospinal meningitis	2	Chicken pox	31																																																																																																																																																																										
Chicken pox	36	Measles	1																																																																																																																																																																										
Diphtheria:		Mumps	83																																																																																																																																																																										
Portland	11	Scarlet fever	23																																																																																																																																																																										
Scattering	12	Typhoid fever	2																																																																																																																																																																										
Influenza	31	Whooping cough	10																																																																																																																																																																										
Measles	6																																																																																																																																																																												
Mumps	16																																																																																																																																																																												
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Scarlet fever	5																																																																																																																																																																												
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Cerebrospinal meningitis	2	Chicken pox	113																																																																																																																																																																										
Chicken pox	36	Diphtheria	43																																																																																																																																																																										
Diphtheria:		German measles	74																																																																																																																																																																										
Portland	11	Measles	13																																																																																																																																																																										
Scattering	12	Mumps	201																																																																																																																																																																										
Influenza	31	Pneumonia	2																																																																																																																																																																										
Measles	6	Scarlet fever	46																																																																																																																																																																										
Mumps	26	Smallpox	38																																																																																																																																																																										
Pneumonia	10	Tuberculosis	31																																																																																																																																																																										
		Typhoid fever	6																																																																																																																																																																										
		Whooping cough	70																																																																																																																																																																										
WEST VIRGINIA		Diphtheria	7																																																																																																																																																																										
		Scarlet fever	8																																																																																																																																																																										
		Smallpox	10																																																																																																																																																																										
		Typhoid fever	2																																																																																																																																																																										

¹ Deaths.

WISCONSIN		WISCONSIN—continued	
	Cases		Cases
Milwaukee:		Scattering—Continued	
Chicken pox	47	Mumps	264
Diphtheria	18	Pneumonia	36
German measles	764	Poliomyelitis	2
Influenza	1	Scarlet fever	170
Measles	426	Smallpox	27
Mumps	139	Tuberculosis	16
Pneumonia	6	Typhoid fever	3
Poliomyelitis	1	Whooping cough	76
Scarlet fever	16		
Smallpox	10		
Tuberculosis	18		
Whooping cough	43		
Scattering:			
Chicken pox	138	WYOMING	
Diphtheria	17	Chicken pox	5
German measles	155	Influenza	2
Influenza	50	Measles	6
Measles	215	Mumps	5

Report for Week Ended March 7, 1925

NORTH DAKOTA		NORTH DAKOTA—continued	
	Cases		Cases
Chicken pox	12	Scarlet fever	53
Diphtheria	4	Smallpox	11
Mumps	2	Tuberculosis	3
Pneumonia	10	Whooping cough	18

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Cerebro-spinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
<i>January, 1925</i>										
District of Columbia	1	76	11	—	45	0	0	134	11	31
Hawaii	6	27	12	—	14	—	2	2	—	9
Iowa	—	91	—	—	—	11	—	265	148	1
Maine	1	51	44	0	68	0	7	120	1	23
Utah	23	47	42	—	44	—	1	55	23	1
<i>February, 1925</i>										
Alabama	7	60	3,338	39	196	16	—	82	884	47
Arizona	—	21	—	—	185	—	—	35	22	7
Arkansas	4	50	1,332	101	110	17	0	89	77	31
Connecticut	2	202	78	—	275	—	1	725	0	14
District of Columbia	—	83	10	—	40	—	—	148	9	6
Indiana	2	174	508	—	—	—	1	892	—	20
Massachusetts	9	497	261	—	2,204	1	4	1,452	—	33
Michigan	—	299	26	—	692	—	8	1,366	62	31

PLAQUE-ERADICATIVE MEASURES IN THE UNITED STATES

The following items were taken from the reports of plague-eradicative measures from the cities named for the week ended February 28, 1925:

Los Angeles, Calif.

Week ended Feb. 28, 1925:

Number of rats examined.....	3,073
Number of rats found to be plague infected.....	17
Number of squirrels examined.....	705
Number of squirrels found to be plague infected.....	0

Totals to Feb. 28, 1925:

Number of rats examined.....	56,096
Number of rats found to be plague infected.....	114
Number of squirrels examined.....	3,009
Number of squirrels found to be plague infected.....	2

Oakland, Calif.

Week ended Feb. 28, 1925:

Number of rats examined.....	2,042
Number of rats found to be plague infected.....	1

Totals to Feb. 28, 1925:

Number of rats examined.....	14,366
Number of rats found to be plague infected.....	20

New Orleans, La.

Week ended Feb. 28, 1925:

Number of vessels inspected.....	378
Number of inspections made.....	886
Number of vessels fumigated with cyanide gas.....	33
Number of rodents examined for plague.....	3,919
Number of rodents found to be plague infected.....	0

Totals to Feb. 28, 1925:

Number of rodents examined for plague.....	46,410
Number of rodents found to be plague infected.....	12

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended February 28, 1925, 35 States reported 1,566 cases of diphtheria. For the week ended March 1, 1924, the same States reported 1,996 cases of this disease. One hundred and one cities, situated in all parts of the country, and having an aggregate population of about 28,600,000, reported 925 cases of diphtheria for the week ended February 28, 1925. Last year for the corresponding week they reported 1,092 cases. The estimated expectancy for these cities was 1,038 cases of diphtheria. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Twenty-eight States reported 3,318 cases of measles for the week ended February 28, 1925, and 18,616 cases of this disease for the week ended March 1, 1924. One hundred and one cities reported 1,953 cases of measles for the week this year, and 6,934 cases last year.

Scarlet fever.—Scarlet fever was reported for the week as follows: Thirty-five States—this year, 4,723 cases; last year, 4,287 cases; 101 cities—this year, 2,227 cases; last year, 1,821 cases; estimated expectancy, 1,038 cases.

Smallpox.—For the week ended February 28, 1925, 34 States reported 1,100 cases of smallpox. Last year for the corresponding week they reported 1,296 cases. One hundred and one cities reported smallpox for the week as follows: 1925, 364 cases; 1924, 514 cases; estimated expectancy, 103 cases. These cities reported 12 deaths from smallpox for the week this year, of which 5 occurred in Minneapolis, Minn., and 3 in Camden, N. J.

Typhoid fever.—Two hundred and twenty-six cases of typhoid fever were reported for the week ended February 28, 1925, by 33 States. For the corresponding week of 1924 the same States reported 199 cases. One hundred and one cities reported 75 cases of typhoid fever for the week this year and 50 cases for the week last year. The estimated expectancy for these cities was 41 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia (combined) were reported for the week by 101 cities as follows: 1925, 1,258 deaths; 1924, 1,247 deaths.

City reports for week ended February 28, 1925

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence how many cases of the disease under consideration may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1915 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1923, estimated	Chick-en pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	73,129	1	2	2	0	0	0	16	2
New Hampshire:									
Concord	22,408	0	1	1	0	0	0	0	0
Vermont:									
Barre	10,008	5	0	1	0	0	1	15	2
Burlington	23,613	0	0	0	0	0	4	16	0
Massachusetts:									
Boston	770,400	29	63	47	35	8	143	7	53
Fall River	120,912	3	5	1	0	0	1	1	5
Springfield	144,227	6	4	1	4	4	55	3	0
Worcester	191,927	21	3	3	2	0	9	0	2
Rhode Island:									
Pawtucket	68,799	0	1	1	0	0	0	0	2
Providence	242,378	0	13	10	2	0	1	0	14
Connecticut:									
Bridgeport	143,555	1	9	4	2	2	3	0	5
Hartford	138,036		9						
New Haven	172,967	14	3	0	3	1	7	0	6

¹ Population Jan. 1, 1920.

City reports for week ended February 28, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chick-en pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	536,718	23	20	4	96	2	73	13	22
New York	5,927,625	232	220	211	96	22	56	26	195
Rochester	317,867	9	9	0	0	0	29	47	4
Syracuse	184,511	6	7	3	0	0	2	16	12
New Jersey:									
Camden	124,157	8	4	8	—	2	18	1	5
Newark	438,699	30	19	10	17	0	37	9	19
Trenton	127,390	1	6	1	2	1	15	0	3
Pennsylvania:									
Philadelphia	1,922,788	65	77	101	—	9	175	27	58
Pittsburgh	613,442	77	23	13	—	3	268	16	46
Reading	110,917	11	3	0	0	0	4	3	2
Scranton	140,636	1	4	3	—	1	0	0	9
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	406,312	29	10	7	—	2	0	10	0
Cleveland	888,519	102	30	21	23	2	4	4	27
Columbus	261,082	14	4	4	—	3	1	7	9
Toledo	268,338	16	6	4	0	0	25	1	13
Indiana:									
Fort Wayne	93,573	8	3	4	0	0	2	0	6
Indianapolis	342,718	29	11	6	—	6	4	3	22
South Bend	76,709	3	1	5	0	0	7	0	3
Terre Haute	68,939	0	1	2	—	1	0	0	10
Illinois:									
Chicago	2,886,121	110	119	54	17	10	418	28	96
Cicero	55,968	8	1	1	0	0	8	4	1
Peoria	79,675	7	2	0	0	0	0	5	3
Springfield	61,833	4	2	1	2	0	1	0	1
Michigan:									
Detroit	995,668	40	59	37	5	6	12	15	42
Flint	117,968	4	6	2	0	0	8	2	6
Grand Rapids	145,947	9	3	0	3	2	13	0	6
Wisconsin:									
Madison	42,519	8	1	0	0	—	3	161	—
Milwaukee	484,595	39	15	15	1	1	354	93	0
Racine	64,393	1	2	2	0	0	18	6	1
Superior	139,671	2	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	106,289	1	2	0	0	0	2	0	5
Minneapolis	409,125	75	16	24	0	0	0	6	10
St. Paul	241,891	31	13	36	0	0	24	48	7
Iowa:									
Davenport	61,262	0	1	4	0	—	4	1	—
Des Moines	140,923	0	3	4	0	0	0	0	—
Sioux City	79,662	7	2	0	0	0	2	44	—
Waterloo	39,667	4	0	1	0	0	0	—	—
Missouri:									
Kansas City	351,819	18	9	11	16	16	2	32	31
St. Joseph	78,232	4	2	1	0	0	1	2	3
St. Louis	803,853	27	47	54	1	1	2	3	—
North Dakota:									
Fargo	24,841	11	0	0	0	0	0	23	2
Grand Forks	14,547	0	0	0	0	—	0	0	—
South Dakota:									
Aberdeen	15,829	4	—	0	0	—	0	0	—
Sioux Falls	29,206	0	1	3	0	0	0	0	0
Nebraska:									
Lincoln	58,761	10	1	1	0	0	0	1	0
Omaha	204,382	8	4	7	0	0	1	0	9
Kansas:									
Topeka	52,555	9	2	1	0	0	1	172	4
Wichita	79,261	—	2	—	—	—	—	—	—

* Population Jan. 1, 1920.

City reports for week ended February 28, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chick-en pox, cases re-ported	Diphtheria		Influenza		Meas-les, cases re-ported	Mumps, cases re-ported	Pneu-monia, deaths re-ported
			Cases, es-timated ex-pectancy	Cases re-ported	Cases re-ported	Deaths re-ported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	117,728	0	2	1	0	0	3	0	0
Maryland:									
Baltimore	773,580	83	26	28	28	4	5	15	50
Cumberland	32,361		0	1	1	0	0		4
Frederick	11,301		0	0	0	0	0		1
District of Columbia:									
Washington	1,437,571	48	11	15	1	1	11		19
Virginia:									
Lynchburg	30,277	2	1	0	0	0	0	23	2
Norfolk	159,069	19	2	0	0	0	0	67	6
Richmond	181,044	6	3	1		6	3	2	14
Roanoke	55,502	3	1	1	1	0	0	0	1
West Virginia:									
Charleston	45,597	3	1	1	0	0	12	0	1
Huntington	57,918	0	1	0	0		0	0	
Wheeling	1,56,208	8	1	0	0	0	1	3	2
North Carolina:									
Raleigh	29,171	10	0	1	0	0	0	0	1
Wilmington	35,719	4	0	0	0	1	0	3	3
Winston-Salem	56,230	10	1	1	0	1	3	1	7
South Carolina:									
Charleston	71,245	0	1	0	0	2	0	0	5
Columbia	39,688	1	1	0	0	1	1	2	2
Greenville	25,789	0	0	0	0	2	0	0	1
Georgia:									
Atlanta	222,963	0	2	5	11	2	0	1	18
Brunswick	15,937		0	0	6	0	1		0
Savannah	89,448		0						
Florida:									
St. Petersburg	24,403	0	0	0	0	0	0	0	7
Tampa	56,050	2	3	1	4	0	0	4	3
EAST SOUTH CENTRAL									
Kentucky:									
Covington	57,877	0	1	0	0	0	2	0	3
Lexington	43,673	1	1	0	0	0	0	0	4
Louisville	257,671	3	5	1	3	1	0	1	16
Tennessee:									
Memphis	170,067		5	4		6	1		8
Nashville	121,128	1	1	0		3	5	0	3
Alabama:									
Birmingham	195,901	9	2	2	16	8	0	3	16
Mobile	63,858	0	1	0	12	4	0	1	5
Montgomery	45,383	2	1	2	4	0	0	19	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	30,635	6	0	1	0		2	5	
Little Rock	70,916	1	1	2	5	3	6	0	3
Louisiana:									
New Orleans	404,575	0	12	16	27	20	1	0	23
Shreveport	58,590	0		0	0	0	1	0	0
Oklahoma:									
Oklahoma	101,150	4	1	5	14	0	0	2	3
Tulsa	102,018		1	1	0		0		
Texas:									
Dallas	177,274	13	5	12	67	1	1	0	7
Galveston	46,877	6	0	1	0	0	0	1	00
Houston	154,970	6	2	2	0	0	0	3	1
San Antonio	184,727	0	3	1	0	5	0	1	8
MOUNTAIN									
Montana:									
Billings	16,927	6	0	0	0	0	0	7	1
Great Falls	27,787	2	1	0	0	0	60	2	1
Helena	12,037	0	0	0	0	0	0	0	0
Missoula	12,668	0	1	2	0	0	30	0	0

¹ Population Jan. 1, 1920.

City reports for week ended February 28, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chick- en pox, cases re- ported	Diphtheria		Influenza		Meas- sles, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths re- ported
			Cases, estimat- ed expec- tancy	Cases re- ported	Cases re- ported	Deaths re- ported			
MOUNTAIN—continued									
Idaho:									
Boise	22,806	4	1	0	0	0	0	0	0
Colorado:									
Denver	272,031	15	9	12	2	3	90	10	
Pueblo	43,519	12	2	0	0	0	13	4	
New Mexico:									
Albuquerque	16,648	3	1	1	3	0	1	3	0
Arizona:									
Phoenix	33,899	2		2		3	0	0	2
Utah:									
Salt Lake City	126,241	28	2	2	0	0	3	44	3
Nevada:									
Reno	12,429	0	0	0	0	0	0	1	0
PACIFIC									
Washington:									
Seattle	1 315,685	59	6	16	0		6	62	
Spokane	104,573	13	3	20	0		0	0	
Tacoma	101,731	1	1	6	0	0	0	0	3
Oregon:									
Portland	273,621	21	5	16	1	0	1	6	11
California:									
Los Angeles	666,853	97	32	29	47	3	12	33	27
Sacramento	63,950	1	1	2		3	0	1	5
San Francisco	539,038	57	26	16	10	1	3	22	5

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, estimat- ed expec- tancy	Cases re- ported	Cases, estimat- ed expec- tancy	Cases re- ported	Deaths re- ported		Cases, estimat- ed expec- tancy	Cases re- ported	Deaths re- ported		
NEW ENGLAND											
Maine:											
Portland	1	0	0	0	0	1	0	1	0	4	33
New Hampshire:											
Concord	0	8	0	0	0	0	0	0	0	0	6
Vermont:											
Barre	0	2	0	0	0	1	0	0	0	0	4
Burlington	1	3	0	0	0	2	0	0	0	1	13
Massachusetts:											
Boston	55	104	0	0	0	16	2	1	1	23	288
Fall River	4	2	0	0	0	4	0	0	0	8	40
Springfield	7	26	0	0	0	2	1	0	0	4	34
Worcester	9	18	0	0	0	0	0	0	0	12	42
Rhode Island:											
Pawtucket	1	0	0	0	0	0	0	0	0	0	23
Providence	9	9	0	0	0	1	0	1	1	0	72
Connecticut:											
Bridgeport	6	15	0	0	0	3	0	1	0	0	37
Hartford	5	0				0					
New Haven	6	26	0	0	0	3	0	1	0	4	54
MIDDLE ATLANTIC											
New York											
Buffalo	20	27	0	1	0	11	1	1	0	32	188
New York	176	343	1	0	0	112	7	5	2	100	1,473
Rochester	12	60	0	0	0	4	1	3	0	4	64
Syracuse	16	4	0	0	0	1	0	2	1	4	51
New Jersey:											
Camden	3	19	0	2	3	1	0	1	0	2	48
Newark	23	42	0	0	0	10	0	0	0	64	99
Trenton	3	4	0	0	0	2	1	0	0	1	37

¹ Population Jan. 1, 1920.¹ Pulmonary tuberculosis only.

City reports for week ended February 28, 1925—Continued

City reports for week ended February 28, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
SOUTH ATLANTIC—continued											
District of Col.:											
Washington	22	38	1	1	1	9	1	0	0	20	157
Virginia:											
Lynchburg	1	0	0	0	0	0	0	0	0	0	12
Norfolk	1	1	0	0	0	1	0	0	0	8	
Richmond	3	4	1	0	0	6	0	1	0	1	63
Roanoke	1	1	0	0	0	1	0	2	0	0	24
West Virginia:											
Charleston	1	0	1	0	0	0	0	0	1	0	16
Huntington	1	0	0	0	0	0	0	0	0	0	
Wheeling	1	1	0	0	0	1	0	2	0	0	22
North Carolina:											
Raleigh	0	1	0	0	0	3	0	0	0	0	9
Wilmington	0	0	0	5	0	1	0	0	0	1	11
Winston-Salem	1	1	1	5	0	0	0	0	0	5	29
South Carolina:											
Charleston	0	0	1	0	0	2	0	2	0	0	29
Columbia	0	0	0	0	0	4	0	0	0	4	16
Greenville	0	0	0	9	0	0	0	0	0	0	13
Georgia:											
Atlanta	4	1	3	1	0	4	0	0	0	9	87
Brunswick	1	0	0	0	0	1	0	0	0	0	1
Savannah	1	0	0	0	0	1	0	0	0	0	
Florida:											
St. Petersburg	2	0	0	0	0	0	0	0	0	0	17
Tampa	0	1	0	0	0	1	1	1	0	1	34
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	2	0	0	0	1	0	1	0	0	13
Lexington	1	1	0	0	0	2	0	1	0	1	18
Louisville	4	12	1	0	0	6	1	0	0	10	98
Tennessee:											
Memphis	3	2	1	7	0	5	1	2	0	0	68
Nashville	2	9	1	4	0	4	0	0	0	0	44
Alabama:											
Birmingham	1	7	1	90	0	6	1	2	1	0	88
Mobile	0	0	1	0	0	2	1	1	0	0	26
Montgomery	0	0	0	1	0	0	0	0	0	0	24
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	2	0	1	0	0	0	0	0	0	
Little Rock	1	2	0	0	0	4	0	0	0	0	
Louisiana:											
New Orleans	4	19	3	2	0	22	2	7	0	0	176
Shreveport	0	0	1	0	0	1	0	1	0	0	20
Oklahoma:											
Oklahoma	2	1	4	0	0	2	0	0	0	2	21
Tulsa	1	2	2	0	0	0	0	0	0	0	
Texas:											
Dallas	1	5	5	0	0	2	0	1	0	1	49
Galveston	0	0	1	8	0	2	0	0	0	0	8
Houston	1	2	1	13	0	2	0	0	0	1	50
San Antonio	1	1	0	0	0	5	0	0	0	0	60
MOUNTAIN											
Montana:											
Billings	1	9	0	0	0	1	0	0	0	14	10
Great Falls	1	2	1	4	0	1	0	3	0	0	8
Helena	0	0	0	0	0	3	0	0	0	0	4
Missoula	0	0	0	0	0	0	0	0	0	0	3
Idaho:											
Boise	0	0	1	1	0	0	0	0	0	0	4
Colorado:											
Denver	12	15	3	0	0	9	0	1	0	1	85
Pueblo	2	3	1	0	0	1	0	4	0	0	10

City reports for week ended February 28, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber-cu-losis, deaths re-ported	Typhoid fever			Whoop-ing cough, cases re-ported	Deaths, all causes
	Cases, es-ti-mated ex-pectancy	Cases re-ported	Cases, es-ti-mated ex-pectancy	Cases re-ported	Deaths re-ported		Cases, es-ti-mated ex-pectancy	Cases re-ported	Deaths re-ported		
MOUNTAIN—CON.											
New Mexico:											
Albuquerque	2	0	0	0	0	2	0	0	0	1	3
Arizona:											
Phoenix		2		0	0	17		0	0	0	38
Utah:											
Salt Lake City	3	2	2	0	0	2	0	0	0	11	33
Nevada:											
Reno	0	2	0	1	0	0	1	0	0	0	3
PACIFIC											
Washington:											
Seattle	10	7	2	31			0	0		40	
Spokane	4	4	8	4			0	0		11	
Tacoma	2	2	3	1	0	1	0	1	0	1	27
Oregon:											
Portland	6	5	6	18	0	7	0	1	0	10	
California:											
Los Angeles	15	45	2	57	0	34	2	2	0	55	205
Sacramento	1	1	0	6	0	1	0	0	0	2	26
San Francisco	17	18	4	9	1	11	1	0	0	22	132

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, es-ti-mated ex-pectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	2	1	0	0	1	0	0
Worcester	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	1	2	10	5	0	0	1	1	1
Rochester	0	0	0	1	0	0	0	0	0
Syracuse	0	0	1	0	0	0	0	0	0
Pennsylvania:									
Pittsburgh	1	1	0	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	1	0	1	0	0	0	0	0	0
Illinois:									
Chicago	2	0	2	1	0	0	0	0	0
Wisconsin:									
Racine	0	0	0	0	0	0	0	1	0
WEST NORTH CENTRAL									
Missouri:									
St. Louis	0	1	0	0	0	0	0	0	0
Nebraska:									
Omaha	0	0	1	1	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	0	0	0	0	1	1
Virginia:									
Norfolk	1	0	0	0	0	0	0	0	0
Roanoke	0	0	0	1	0	0	0	0	0
North Carolina:									
Wilmington	0	0	0	0	0	1	0	0	0

City reports for week ended February 28, 1925—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans.....	0	0	0	0	1	1	0	0	0
Shreveport.....	0	0	0	0	0	1	0	0	0
Oklahoma:									
Oklahoma.....	0	0	0	0	0	1	0	0	0
Texas:									
San Antonio.....	0	0	0	0	0	1	0	0	0
PACIFIC									
California:									
San Francisco.....	0	0	1	1	0	0	0	0	0

The following table gives the rates per hundred thousand population for 105 cities for the 10-week period ended February 28, 1925. The population figures used in computing the rates were estimated as of July 1, 1923, as this is the latest date for which estimates are available. The 105 cities reporting cases had an estimated aggregate population of nearly 29,000,000 and the 97 cities reporting deaths had more than 28,000,000 population. The number of cities included in each group and the aggregate populations are shown in a separate table below.

*Summary of weekly reports from cities, December 21, 1924, to February 28, 1925—
Annual rates per 100,000 population¹*

DIPHTHERIA CASE RATES

	Week ended—										
	Dec. 27	Jan. 3	Jan. 10	Jan. 17	Jan. 24	Jan. 31	Feb. 7	Feb. 14	Feb. 21	Feb. 28	
Total.....	150	163	169	172	163	166	175	168	150	169	
New England.....	189	258	256	179	171	199	191	246	241	189	
Middle Atlantic.....	149	140	181	188	175	155	171	165	163	178	
East North Central.....	134	151	132	141	130	135	145	132	123	119	
West North Central.....	168	176	143	255	199	251	255	259	209	295	
South Atlantic.....	134	146	173	106	138	128	153	183	160	118	
East South Central.....	51	91	120	91	80	97	63	69	80	51	
West South Central.....	116	148	144	195	162	148	176	162	125	162	
Mountain.....	209	191	239	153	239	134	191	95	162	153	
Pacific.....	226	281	194	206	223	293	270	180	165	258	

¹ The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1923.

² Wilmington, Del., not included. Report not received at time of going to press.

³ Racine, Wis., not included.

⁴ Savannah, Ga., not included.

⁵ Hartford, Conn.; Wichita, Kans., and Savannah, Ga., not included.

⁶ Hartford, Conn., not included.

⁷ Wichita, Kans., not included.

Summary of weekly reports from cities, December 21, 1924, to February 28, 1925—
Annual rates per 100,000 population—Continued

MEASLES CASE RATES

	Week ended—									
	Dec. 27	Jan. 3	Jan. 10	Jan. 17	Jan. 24	Jan. 31	Feb. 7	Feb. 14	Feb. 21	Feb. 28
Total	105	158	215	141	213	214	254	297	384	358
New England	278	380	395	440	497	484	576	661	720	658
Middle Atlantic	235	121	169	157	187	205	205	287	373	343
East North Central	138	294	417	127	379	373	453	515	688	632
West North Central	10	10	19	12	27	21	17	31	27	75
South Atlantic	35	53	83	43	38	37	49	98	114	84
East South Central	0	17	29	46	74	91	51	74	51	41
West South Central	14	9	5	23	14	14	37	51	14	56
Mountain	19	115	134	267	286	782	153	620	916	61
Pacific	70	116	194	160	55	17	61	29	64	61

SCARLET FEVER CASE RATES

Total	244	300	369	355	370	364	412	400	391	408
New England	512	609	661	561	596	534	614	564	606	658
Middle Atlantic	225	286	324	294	322	322	373	407	376	412
East North Central	230	243	383	375	369	379	426	397	432	434
West North Central	468	527	757	755	804	779	871	728	742	758
South Atlantic	132	203	160	243	189	185	255	277	166	206
East South Central	126	172	229	183	183	217	97	212	223	183
West South Central	65	83	148	116	195	204	162	121	125	144
Mountain	191	162	382	534	305	258	334	382	248	315
Pacific	133	247	189	183	220	220	258	177	186	223

SMALLPOX CASE RATES

Total	41	48	57	58	70	67	76	79	66	66
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	2	3	3	10	6	9	2	4	2	3
East North Central	20	27	40	39	48	35	39	35	56	28
West North Central	205	129	220	193	180	195	145	193	126	124
South Atlantic	28	39	30	64	38	45	62	98	69	44
East South Central	183	372	395	217	675	652	823	675	532	583
West South Central	19	32	65	32	32	60	125	139	83	116
Mountain	48	48	29	57	95	48	29	162	86	57
Pacific	122	191	148	212	209	177	267	220	215	313

TYPHOID FEVER CASE RATES

Total	35	37	36	21	17	18	13	13	11	14
New England	17	25	15	25	20	7	30	20	0	13
Middle Atlantic	57	58	49	21	20	19	13	6	10	8
East North Central	24	28	23	11	10	8	6	6	7	7
West North Central	19	4	6	10	6	12	0	10	4	17
South Atlantic	37	41	55	21	11	37	17	34	8	21
East South Central	34	40	51	17	29	23	11	40	34	34
West South Central	28	37	70	70	42	60	23	46	42	42
Mountain	0	0	10	0	48	19	29	19	38	76
Pacific	15	17	26	6	15	3	17	12	23	9

² Wilmington, Del., not included. Report not received at time of going to press.

³ Racine, Wis., not included.

⁴ Savannah, Ga., not included.

⁵ Hartford, Conn.; Wichita, Kans., and Savannah, Ga., not included.

⁶ Hartford, Conn., not included.

⁷ Wichita, Kans., not included.

*Summary of weekly reports from cities, December 21, 1924, to February 28, 1925—
Annual rates per 100,000 population—Continued*

INFLUENZA DEATH RATES

	Week ended—									
	Dec. 27	Jan. 3	Jan. 10	Jan. 17	Jan. 24	Jan. 31	Feb. 7	Feb. 14	Feb. 21	Feb. 28
Total	15	19	21	22	22	23	30	28	30	34
New England	15	3	17	27	10	27	47	27	17	40
Middle Atlantic	14	21	20	18	20	16	24	22	21	20
East North Central	16	10	16	15	18	12	13	17	18	24
West North Central	7	9	13	2	20	15	20	11	22	39
South Atlantic	14	26	35	47	23	39	49	55	55	42
East South Central	51	63	46	46	63	74	69	63	74	126
West South Central	15	51	41	87	92	82	97	122	153	148
Mountain	10	38	19	29	10	38	57	57	57	19
Pacific	12	12	20	12	12	20	41	4	12	29

PNEUMONIA DEATH RATES

Total	157	203	192	215	211	206	225	222	216	201
New England	114	174	122	157	216	241	211	239	241	242
Middle Atlantic	178	226	228	260	234	230	253	231	216	185
East North Central	126	165	152	152	142	145	164	168	184	171
West North Central	92	101	90	107	120	118	134	131	131	161
South Atlantic	205	250	246	294	275	252	315	270	253	309
East South Central	206	303	292	189	320	303	326	320	320	292
West South Central	229	341	260	449	362	229	352	464	408	260
Mountain	219	229	229	248	324	315	191	277	219	267
Pacific	147	188	184	163	208	217	196	192	213	163

¹ Wilmington, Del., not included. Report not received at time of going to press.

² Racine, Wis., not included.

⁴ Savannah, Ga., not included.

⁵ Hartford, Conn.; Wichita, Kans., and Savannah, Ga., not included.

⁶ Hartford, Conn., not included.

⁷ Wichita, Kans., not included.

Number of cities included in summary of weekly reports and aggregate population of cities in each group, estimated as of July 1, 1923

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases	Aggregate population of cities reporting deaths
Total	105	97	28,898,350	28,140,934
New England	12	12	2,098,746	2,098,746
Middle Atlantic	10	10	10,304,114	10,304,114
East North Central	17	17	7,032,535	7,032,535
West North Central	14	11	2,515,330	2,381,454
South Atlantic	22	22	2,566,901	2,566,901
East South Central	7	7	911,885	911,885
West South Central	8	6	1,124,564	1,023,013
Mountain	9	9	546,445	546,445
Pacific	6	3	1,797,630	1,275,841

FOREIGN AND INSULAR

CANADA

Communicable diseases—Ontario—February 1-28, 1925 (comparative).—During the period February 1 to 28, 1925, communicable diseases were notified in the Province of Ontario, Canada, as follows:

Disease	1925		1924	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis.....	8	4	2	1
Chancroid.....	15	—	4	—
Chicken pox.....	539	—	600	—
Diphtheria.....	285	17	294	34
German measles.....	13	1	29	—
Goiter.....	44	3	6	4
Gonorrhoea.....	216	—	108	—
Influenza.....	—	24	39	15
Lethargic encephalitis.....	11	9	1	—
Measles.....	1,576	3	1,914	4
Mumps.....	1,112	—	787	1
Pneumonia.....	—	241	—	180
Poliomyelitis.....	4	3	2	—
Scarlet fever.....	621	10	940	10
Smallpox.....	14	1	125	14
Syphilis.....	163	—	101	—
Tuberculosis.....	158	88	145	101
Typhoid fever.....	40	3	23	3
Whooping cough.....	427	8	202	5

Smallpox.—Smallpox was reported in 10 localities, the largest number of cases, viz, 3, with 1 death, being reported at Stratford.

CANARY ISLANDS

Plague—Las Palmas—February 4, 1925.—Under date of February 4, 1925, a new case of bubonic plague was reported at Las Palmas, Canary Islands.

CUBA

Communicable diseases—February 1-28, 1925.—During the period February 1 to 28, 1925, communicable diseases were reported at Habana, Cuba, as follows:

Disease	Feb. 1-28, 1925		Remaining under treatment Feb. 28, 1925
	New cases	Deaths	
Chicken pox.....	5	—	2
Diphtheria.....	19	—	6
Leprosy.....	1	—	10
Malaria.....	60	1	36
Measles.....	35	1	16
Scarlet fever.....	7	—	5
Typhoid fever.....	20	6	27

¹ Reported for week ended Feb. 28, 1925.

² A number of cases of malaria and typhoid fever were from the interior of the island; one case of typhoid fever and one case of malaria were from abroad.

ECUADOR

Communicable diseases—Mortality—Quito—January, 1925.—During the month of January, 1925, communicable diseases were reported at Quito, Ecuador, as follows: Dysentery, 156 cases, of which 44 were from localities outside the city, with 7 deaths; tuberculosis, pulmonary, 15 cases with 15 deaths; other forms of tuberculosis, 2 deaths; typhoid fever, 8 cases with 1 death; whooping cough, 32 cases with 1 death. The total number of deaths from all causes was 153, of which 54 deaths were of children under 1 year of age. Population, 100,525.

Plague—February 1–15, 1925.—During the period February 1 to 15, 1925, plague was reported in Ecuador as follows: Guayaquil—14 cases with 5 deaths; Yaguachi—1 case with 1 death.

Plague—Infected rats—Guayaquil.—During the same period, 76 rats were found plague infected at Guayaquil out of 12,165 rats taken.

FRANCE

Smallpox—Saint Malo—February, 1925.—During the week ended February 8, 1925, seven cases of virulent smallpox, with one death, were reported at the port of Saint Malo, department of Ille et Vilaine, France. The disease was reported to have been brought by the steamship *Ruyth*, which arrived during the latter part of January from Sfax, Tunis.

HUNGARY

Protective measures in effect in frontier districts.—According to information received under date of February 12, 1925, the provisions of an agreement between Austria and Hungary for the protection of frontier districts against the importation of epidemic diseases were put into effect January 1, 1925. These provisions require authorities in the frontier districts of the two countries to report mutually all cases of epidemic disease occurring in their respective districts.

MADAGASCAR

Plague—December 16–31, 1924—January 1–15, 1925.—Plague has been reported in the island of Madagascar as follows: December 16 to 31, 1924—cases, 75; deaths, 66. January 1 to 15, 1925—cases, 54; deaths, 48. For distribution according to locality and type, see page 583.

MALTA

Lethargic encephalitis—Malta (undulant) fever—Typhoid fever—January 16–31, 1925.—During the period January 16 to 31, 1925, 6 cases of lethargic encephalitis, 16 cases of Malta (undulant) fever, and 2 cases of typhoid fever were reported in the Island of Malta. Population, 216,702.

MEXICO

Further relative to epidemic cerebrospinal meningitis, States of Guerrero and Oaxaca—Outbreak in State of Morelos.—The epidemic prevalence of cerebrospinal meningitis in the States of Guerrero and Oaxaca, Mexico, reported February 21, 1925,¹ was stated, February 26, 1925, to be unchanged. In the State of Morelos the disease was stated to have assumed an alarming character requiring energetic measures of control. At Jojutla churches and schools had been ordered closed by the department of health and it was proposed to adopt this measure at all points where new cases developed.

SALVADOR

Yellow fever—San Salvador—June—October, 1924.—The following statements in regard to yellow fever in the city of San Salvador, Republic of Salvador, from June to October 22, 1924, is taken from a report made to the Department of State:

During the month of June, 1924, yellow fever was definitely diagnosed in the city of San Salvador. The epidemic is believed to have terminated with the confirmation of a case at Ahuachapan, October 22, 1924. The total number of cases reported during the period covered by this report was 77, with 28 recorded deaths.

Early in October, 1924, the International Health Board, in cooperation with the National Health Board of Salvador, began a campaign directed against the yellow fever mosquito, *Aedes aegypti*.

UNION OF SOUTH AFRICA

Plague—January 18–24, 1925.—During the week ended January 24, 1925, three cases of plague with one death, occurring in the native population, were reported in the Union of South Africa. For distribution of occurrence according to locality, see page 583.

Plague infection in wild rodents—De Aar District.—Information received under date of February 6, 1925, shows that plague infection in wild rodents had existed for two months previously to January 24, 1925, on the Ganzfontein and neighboring farms, about 40 miles south of De Aar, where, it is stated, five human cases of plague with two deaths have been reported. In this area, ground squirrels, springhares, and Cape hares (Vlakhaas) were said to be numerous, and heavy mortality among these animals was reported. Observations indicate that the infection was introduced, probably from a considerable distance, by some of these rodents. One of the cases notified, which was one of the pneumonic type, occurred in a native who lived in the open veld, slept at night in a "scherm" or inclosure of stones, and whose sole diet was mealie (maize) meal and the flesh of squirrels and springhares. One

¹ Public Health Reports, Mar. 6, 1925, p. 476.

of the first cases in the De Aar outbreak, infected on a farm and also of pneumonic type, gave a similar history. A study of rat fleas from infected localities was stated to be in progress, conducted by officials of the Department of Public Health.

Smallpox—Typhus fever—December, 1924.—During the month of December, 1924, 7 cases of smallpox, occurring in the native or colored population, and 114 cases of typhus fever with 21 deaths, of which 2 cases occurred in the European or white population, were reported in the Union of South Africa. For distribution of occurrence according to locality, see page 585.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended March 20, 1925¹

CHOLERA

Place	Date	Cases	Deaths	Remarks
India.....				Jan. 4-10, 1925: Cases, 2,328; deaths, 1,320.
Calcutta.....	Jan. 18-24.....	19	17	
Madras.....	Jan. 25-31.....	20	15	
Rangoon.....	Jan. 18-24.....	1	1	

PLAQUE

Canary Islands: Las Palmas.....	Feb. 4.....	1		
Ceylon: Colombo.....	Jan. 25-31.....	3		Four plague rodents.
Ecuador: Guayaquil.....	Feb. 1-15.....	14	5	Plague-infected rats: 76; rats taken, 12,165
Yaguachi.....	do.....	1	1	
India.....				Jan. 4-10, 1925: Cases, 4,290; deaths, 3,461.
Calcutta.....	Jan. 18-24.....	1	1	
Madras Presidency.....	Jan. 4-10.....	214	164	
Rangoon.....	Jan. 11-24.....	20	17	
Java: East Java— Soerabaya.....	Dec. 28-31.....	13	11	
Madagascar: Tananarive Province.....				Dec. 16-31, 1924: Cases, 75; deaths, 66. Jan. 1-15, 1925: Cases, 54; deaths, 48. Bubonic, pneumonic, septicemic.
Tananarive Town.....	Dec. 16-31.....	4	4	
Do.....	Jan. 1-15.....	1	1	
Other localities.....	Dec. 16-31.....	71	62	
Do.....	Jan. 1-15.....	53	47	
Morocco: Marrakech.....				Feb. 9, 1925: Present in native quarter of town. Stated to be pneumonic in form and of high mortality.
Union of South Africa.....				Jan. 18-24, 1925: Cases, 3; deaths, 1.
Orange Free State— Kroonstad District.....	Jan. 18-24.....	1	1	Native; on farm.
Transvaal— Boshof District.....	do.....	2		Do.

¹ From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.
Reports Received During Week Ended March 20, 1925—Continued
SMALLPOX

Place	Date	Cases	Deaths	Remarks
Arabia: Aden.....	Feb. 1-7.....	2.....	.....	Imported.
Brazil: Pernambuco.....	Jan. 4-10.....	15.....	6.....	
British East Africa: Kenya— Mombasa.....	Jan. 18-24.....	1.....	.....
Canada: British Columbia— Vancouver.....	Feb. 22-28.....	44.....	.....	Feb. 1-28, 1925: Cases, 14; deaths, 1. Corresponding period, 1924: Cases, 125; deaths, 14.
Ontario.....				
Ceylon: Colombo.....	Jan. 25-31.....	1.....	.....	Port case.
China: Shanghai.....	Feb. 1-7.....	2.....	3.....	Deaths among Chinese.
France: St. Malo.....	Feb. 2-8.....	7.....	1.....	Believed to have been imported on steamship <i>Ruyth</i> from Sfax, Tunis.
Germany: Frankfort-on-Main.....	Jan. 1-10.....	1.....	.....
Great Britain: Newcastle.....	Feb. 8-14.....	3.....	.....	Jan. 4-10, 1925: Cases, 2,442; deaths, 497.
India.....				
Calcutta.....	Jan. 18-24.....	94.....	63.....	
Karachi.....	Feb. 1-7.....	13.....	2.....	
Madras.....	Jan. 25-31.....	39.....	13.....	
Rangoon.....	Jan. 11-24.....	123.....	20.....	
Japan: Nagasaki.....	Feb. 9-15.....	3.....	.....
Java: East Java— Soerabaya.....	Dec. 28-31.....	23.....	4.....	
Mexico: Durango.....	Feb. 1-28.....	.....	5.....	
Saltillo.....	Feb. 22-28.....	.....	1.....	
Tampico.....	Feb. 11-28.....	17.....	7.....	
Vera Cruz.....	Feb. 22-28.....	.....	6.....	
Spain: Cadiz.....	Jan. 1-31.....	.....	9.....	
Malaga.....	Feb. 15-21.....	.....	5.....	
Valencia.....	Feb. 15-21.....	2.....	.....
Switzerland: Lucerne.....	Jan. 1-31.....	24.....	.....
Tunis: Tunis.....	Feb. 19-25.....	16.....	27.....	
Syria: Aleppo.....	Feb. 8-14.....	10.....	2.....	Dec. 1-31, 1924: Cases, 7; in colored population.
Union of South Africa.....				
On vessel: S. S. <i>Ruyth</i>				At St. Malo, France, from Sfax, Tunis; believed to have imported smallpox infection.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.
Reports Received During Week Ended March 20, 1925—Continued
TYPHUS FEVER

Place	Date	Cases	Deaths	Remarks
Chile: Iquique.....	Feb. 1-7.....		1	
Egypt: Cairo.....	Dec. 17-23.....	1		
Turkey: Constantinople.....	Feb. 1-7.....	1	1	
Union of South Africa.....				Dec. 1-31, 1924: Cases, 112; deaths, 21, occurring in natives; in white population, 2 cases.
Cape Province.....				Dec. 1-31, 1924: Cases, 37; deaths, 8.
East London.....	Jan. 18-24.....	1		Dec. 1-31, 1924: Cases, 25; deaths, 5.
Natal.....				Jan. 18-24, 1925: Outbreaks.
Do.....				Dec. 1-31, 1924: Cases, 38; deaths, 6.
Orange Free State.....				Dec. 1-31, 1924: Cases, 12; deaths, 2.
Transvaal.....				
Yugoslavia: Belgrade.....	Dec. 22-28.....	1		

YELLOW FEVER

Salvador: San Salvador.....	June-Oct. 1924.....	77	28	Last case, Oct. 22, 1924.
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Reports Received from December 27, 1924, to March 13, 1925¹
CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon.....				June 29-Nov. 29, 1924: Cases, 9; deaths, 8.
Colombo.....	Nov. 16-22.....	1		
Do.....	Jan. 11-24.....	2	2	
India.....				Oct. 19, 1924, to Jan. 3, 1925: Cases, 27,164; deaths, 16,223.
Bombay.....	Nov. 23-Dec. 20.....	4	4	
Calcutta.....	Oct. 26-Jan. 3.....	59	51	
Do.....	Jan. 4-17.....	20	20	
Madras.....	Nov. 16-Jan. 3.....	69	40	
Do.....	Jan. 4-24.....	74	53	
Rangoon.....	Nov. 9-Dec. 20.....	9	2	
Do.....	Jan. 4-10.....	4	3	
Indo-China.....				Aug. 1-Sept. 30, 1924: Cases, 14; deaths, 10.
Province—				
Anam.....	Aug. 1-31.....	1	1	
Cambodia.....	Aug. 1-Sept. 30.....	6	5	
Cochin-China.....	do.....	7	4	
Saigon.....	Nov. 30-Dec. 6.....	1		
Siam: Bangkok.....	Nov. 9-29.....	4	2	

¹ From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from December 27, 1924, to March 13, 1925—Continued

PLAQUE

Place	Date	Cases	Deaths	Remarks
Azores:				
Fayal Island—				
Castelo Branco.....	Nov. 25.....			
Feteira.....	do.....	1		
St. Michael Island.....	Nov. 2-Jan. 3.....	30	13	Present with several cases.
British East Africa:				
Tanganika Territory.....	Nov. 23-Dec. 27.....	17	10	
Uganda.....	Aug.-Nov., 1924.....	242	211	
Canary Islands:				
Las Palmas.....				Stated to have been infected with plague Sept. 30, 1924.
Realejo Alto.....	Dec. 19.....	3	1	Vicinity of Santa Cruz de Tenerife.
Tenerife—				
Santa Cruz.....	Jan. 3.....	1		In vicinity.
Celebes:				
Macassar.....	Oct. 29.....			Epidemic.
Ceylon:				
Colombo.....	Nov. 9-Jan. 3.....	12	9	
Do.....	Jan. 4-24.....		4	One plague rodent.
China:				
Foochow.....	Dec. 28-Jan. 3.....			Present.
Nanking.....	Nov. 23-Jan. 31.....			Do.
Shing Hsien.....	Oct., 1924.....		790	
Ecuador:				
Chimborazo Province—				
Alausi District.....	Jan. 14.....		14	At two localities on Guayaquil and Quito Railway.
Guayaquil.....	Nov. 16-Dec. 31.....	9	3	Rats taken, 27,004; found infected, 92.
Do.....	Jan. 1-31.....	17	7	Rats taken, 19,087; rats found infected, 68.
Egypt:				Year 1924: Cases, 373. Jan. 1-28, 1925: Cases, 15.
City—				
Alexandria.....	Year 1924.....	2	2	Last case, Nov. 26.
Ismailia.....	do.....	1	1	Last case, July 6.
Port Said.....	do.....	6	4	Last case, Dec. 7.
Suez.....	do.....	20	13	Last case, Dec. 20.
Province—				
Dakhalia.....	Jan. 1-8.....	1	1	
Kalioubiah.....	do.....	3		
Menoufiah.....	do.....	7	3	
Gold Coast				Sept.-Oct., 1924: Deaths, 42.
Hawaii:				Plague-infected rodents found
Honokaa.....	Nov. 4.....	1		Dec. 9, 1924, and Jan. 15, 1925.
India:				Oct. 19, 1924, to Jan. 3, 1925: Cases 28,154; deaths, 21,505.
Bombay.....	Nov. 22-Jan. 3.....	4	3	
Do.....	Jan. 4-17.....	2	2	
Karachi.....	Nov. 30-Dec. 6.....	2	1	
Do.....	Jan. 4-24.....	10	9	
Madras Presidency.....	Nov. 23-Dec. 20.....	528	379	
Do.....	Dec. 28-Jan. 3.....	157	108	
Rangoon.....	Oct. 26-Jan. 3.....	26	25	
Do.....	Jan. 4-10.....	8	6	
Indo-China:				Aug. 1-Sept. 30, 1924: Cases, 25; deaths, 20.
Province—				
Anam.....	Aug. 1-Sept. 30.....	4	4	
Cambodia.....	do.....	18	15	
Cochin-China.....	do.....	3	1	
Saigon.....	Jan. 11-17.....	2	1	Including 100 square kilometers of surrounding territory.
Japan:				
Java:				
East Java—				Province of Kediri; epidemic.
Bililar.....	Nov. 11-22.....			Do.
Pare.....	Nov. 29.....			
Soerabaya.....	Nov. 16-Dec. 13.....	53	55	
Do.....	Dec. 21-27.....	5	6	
West Java—				
Cheribon.....	Oct. 14-Nov. 3.....		14	
Do.....	Nov. 18-Dec. 22.....		80	
Pekalongan.....	Oct. 14-Nov. 3.....		29	
Do.....	Nov. 18-Dec. 22.....		133	
Tegal.....	Oct. 14-Nov. 24.....		10	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.
Reports Received from December 27, 1924, to March 13, 1925—Continued
PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Madagascar.				Nov. 1-Dec. 15, 1924: Cases, 254; deaths, 218.
Provinces—				
Itasy	Nov. 1-Dec. 15....	4	2	
Moramanga	do	49	34	
Tananarive	Oct. 16-Dec. 15....	223	208	Tananarive City (interior), Oct. 16-Nov. 30: Cases, 8; deaths, 7.
Towns (ports)—				
Fort Dauphin.	Nov. 1-Dec. 15....	12	5	
Majunga	Nov. 1-30	1	1	
Tamatave	do	1	1	
Mauritius Island.				Sept. 7-Oct. 18, 1924: Cases, 60; deaths, 53.
Nigeria.				Aug. - Oct., 1924: Cases, 300; deaths, 256.
Siam:				
Bangkok	Dec. 28-Jan. 3....	1	1	
Siberia:				
Transbaikalia—				
Turga	Oct., 1924		3	
Straits Settlements:				On Chita Railroad.
Singapore	Nov. 9-15	1	1	
Do	Jan. 4-17	3	2	
Syria:				
Beirut	Jan. 11-20	1		
Turkey:				
Constantinople	Jan. 9-15	5	5	
Union of South Africa.				
Cape Province—				
De Aar District	Nov. 22-Jan. 3....	4	1	Native.
Do	Jan. 4-10	2		Natives; on farms.
Dronfield	Dec. 7-13	1		8 miles from Kimberley.
Kimberley	Dec. 7-27	3	2	
Maraisburg District	Nov. 22-Dec. 13....	4	2	Bubonic, on Goedshoop Farm.
Orange Free State—				
Bloemfontein District	Dec. 21-Jan. 3....	5	2	
Do	Jan. 11-17	1	1	Native; on farm.
Ficksburg District	Dec. 28-Jan. 3....	1	1	
Hoopstad District	Dec. 7-13	1		On farm.
Kroonstad District	Nov. 22-Jan. 3....	2	1	
Philippolis District	Dec. 21-27	1		On farms.
Vrededorp District	Dec. 7-20	2	2	Native; on farm. Province not stated.
Steynsburg District	Jan. 4-10	1		
Transvaal—				
Boshof District	Dec. 7-Jan. 3....	3	3	On farm.
Do	Jan. 11-17	5	1	Native, 4 cases; white, one fatal case. On farms.
Smithfield	do	1		On Farm Wolverspruit, Vaal River. Native.
Wolmaransstad District	Nov. 22-29	1	1	
On vessel:				
S. S. Conde				At Marseille, France, Nov. 6, 1924. Plague rat found. Vessel left for Tamatave, Madagascar, Nov. 12, 1924.
Steamship	November, 1924	1	1	At Majunga, Madagascar, from Djibuti, Red Sea port.

SMALLPOX

Algeria.				July 1-Dec. 20, 1924: Cases, 372.
Algiers	Jan. 1-31	5		
Arabia:				
Aden	Jan. 25-31	1		Imported.
Bolivia:				
La Paz	Nov. 1-Dec. 31....	20	11	
Brazil:				
Pernambuco	Nov. 9-Jan. 3....	100	27	
British East Africa:				
Uganda—				
Entebbe	Oct. 1-31	4		
British South Africa:				
Northern Rhodesia	Oct. 28-Dec. 15....	57	2	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from December 27, 1924, to March 13, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Canada:				
British Columbia—				
Vancouver	Dec. 14-Jan. 3	32		
Do.	Jan. 4-Feb. 21	162		
Victoria	Jan. 18-Feb. 7	2		
Manitoba—				
Winnipeg	Dec. 7-Jan. 3	14		
Do.	Jan. 4-Feb. 27	30		
New Brunswick—				
Bonaventure and Gaspe Counties	Jan. 1-31	1		
Northumberland	Feb. 8-14	1		
Ontario	Jan. 24-30	1		
Hamilton				
Ceylon	Jan. 18-24	2		
Colombo				
China:				
Amoy	Nov. 9-Jan. 24			
Antung	Nov. 17-Dec. 28	5		
Do.	Jan. 5-18	4		
Foochow	Nov. 2-Jan. 27			
Hongkong	Nov. 9-Jan. 3	6	2	
Nanking	Jan. 4-17			
Shanghai	Dec. 7-27	1	2	
Do.	Jan. 18-24	1		
Chosen:	Dec. 1-31	1		
Seoul				
Czechoslovakia				
Ecuador:				
Guayaquil	Nov. 16-Dec. 15	4		
Egypt:				
Alexandria	Nov. 12-Dec. 31	10		
Do.	Jan. 8-28	8		
Estonia				
France				
Germany				
Gibraltar	Dec. 8-14	1		
Gold Coast				
Great Britain:				
England and Wales	Nov. 23-Jan. 3	472		
Do.	Jan. 4-24	351		
Newcastle-on-Tyne	Jan. 18-Feb. 7	5		
Greece:				
Do.				
Saloniki	Nov. 11-Dec. 22	3		
India:				
Bombay	Nov. 2-Jan. 3	30	18	
Do.	Jan. 4-17	17	11	
Calcutta	Oct. 26-Jan. 3	307	170	
Do.	Jan. 4-17	168	101	
Karachi	Nov. 16-Jan. 3	16	2	
Do.	Jan. 4-31	26	3	
Madras	Nov. 16-Jan. 3	122	48	
Do.	Jan. 4-24	73	23	
Rangoon	Oct. 26-Jan. 3	86	28	
Do.	Jan. 4-10	33	4	
Indo-China				
Province—				
Anam	Aug. 1-Sept. 30	49	11	
Cambodia	do	40	9	
Cochin-China	do	115	49	
Saigon	Nov. 16-Jan. 3	17	5	
Do.	Jan. 4-10	3	1	
Iraq:	Aug. 1-Sept. 30	19	7	
Bagdad	Nov. 9-Dec. 27	2	1	
Italy				

County.
Nov. 30-Dec. 27, 1924: Cases, 33.
Dec. 28, 1924, to Jan. 31, 1925:
Cases, 27.
July 27-Nov. 29, 1924: Cases, 27;
deaths, 1.

Present.

Do.

Do.

Apr.-June, 1924: Case, 1; occurring in Province of Maravia.

Dec. 1-31, 1924: Cases, 2
July-Nov., 1924: Cases, 69.
June 29-Nov. 8, 1924: Cases, 7.

July-Sept., 1924: Cases, 82;
deaths, 1.

Jan.-June, 1924: Cases, 170;
deaths, 27.
July-Nov., 1924: Cases, 36;
deaths, 26.

Oct. 10, 1924, to Jan. 3, 1925:
Cases, 12,564; deaths, 2,857.

Mar. 5, 1925: Epidemic.

Aug. 1-Sept. 30, 1924: Cases, 223
deaths, 76.

Including 100 sq. km. of surrounding country.

June 29-Dec. 6, 1924: Cases, 61.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.
Reports Received from December 27, 1924, to March 13, 1925—Continued
SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Jamaica				
Do.				
Kingston	Nov. 30-Dec. 27	4		
Japan				
Java:				
East Java—				
Pasoeorean	Oct. 26-Nov. 1	9	1	
Do.	Nov. 12-19			
Soerabaya	Oct. 19-Dec. 27	662	208	Epidemic in two native villages.
West Java—				
Batam	Oct. 14-20	2		
Batavia	Oct. 21-Nov. 14	2		
Do.	Dec. 20-Jan. 2	19	4	
Cheribon	Oct. 14-Nov. 24	15		
Pekalongan	do	22		
Praanger	Nov. 18-24	1		
Latvia				
Mexico:				
Durango	Dec. 1-31		5	
Do.	Jan. 1-31		5	Town and district.
Guadalajara	Dec. 23-29		1	
Do.	Jan. 6-12		1	
Mexico City	Nov. 23-Dec. 27	5		
Do.	Jan. 11-31	5		
Monterey				
Salina Cruz	Dec. 1-31	1	1	
Tampico	Dec. 11-31	5	4	
Do.	Jan. 1-Feb. 10	23	8	
Vera Cruz	Dec. 1-Jan. 3		10	
Do.	Jan. 5-Feb. 15		25	
Villa Hermosa	Dec. 28-Jan. 10			
Nigeria				
Do.				
Persia:				
Teheran				
Peru:				
Arequipa	Nov. 24-30		1	
Poland				
Portugal:				
Lisbon	Dec. 7-Jan. 3	17		
Do.	Jan. 4-Feb. 7	45		
Oporto	Nov. 30-Dec. 27	3	2	
Do.	Jan. 11-17	1		
Russia				
Siam:				
Bangkok	Dec. 28-Jan. 3	1	1	
Spain:				
Barcelona	Nov. 27-Dec. 31		5	
Cadiz	Nov. 1-Dec. 31		51	
Madrid	Year 1924		40	
Malaga	Nov. 23-Jan. 3		97	
Do.	Jan. 4-Feb. 14		63	
Valencia	Nov. 30-Dec. 6	2		
Switzerland:				
Lucerne	Nov. 1-Dec. 31	19		
Syria:				
Aleppo	Nov. 23-Dec. 27	13		
Do.	Jan. 4-Feb. 7	45	15	
Damascus	Jan. 6-13	2		
Tunis:				
Tunis	Nov. 25-Dec. 29	42	35	
Do.	Jan. 1-14		29	
Do.	Jan. 22-Feb. 18		93	
Turkey:				
Constantinople	Dec. 13-19	5		
Union of South Africa.				
Cape Province	Nov. 9-Jan. 17			Nov. 1-30, 1924: Cases, 7.
Orange Free State	Nov. 2-8			Outbreaks.
Transvaal	Nov. 9-Jan. 10			Do.
				Do.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from December 27, 1924, to March 13, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Uruguay				Jan.-June, 1924: Cases, 101; deaths, 2.
Do				July, 1924: Cases, 25; deaths, 3.
On vessel: S. S. Habana	Feb. 18	1		At Santiago de Cuba, from Kingston, Jamaica.

TYPHUS FEVER

Algeria:				July 1-Dec. 20, 1924: Cases, 101; deaths, 14.
Algiers	Nov. 1-Dec. 31	5	1	
Do	Jan. 1-31	3	3	
Bolivia:				
La Paz	do	3		
Bulgaria:				Jan.-June, 1924: Cases, 191; deaths, 28.
Do				July-Oct., 1924: Cases, 5.
Chile:				
Concepcion	Nov. 25-Dec. 1	1		
Do	Jan. 6-12	2		
Iquique	Nov. 30-Dec. 1	2		
Talcahuano	Nov. 16-Dec. 20	5		
Do	Jan. 4-10	1		
Valparaiso	Nov. 25-Dec. 7	4		
Do	Jan. 11-31	4		
Chosen:				
Seoul	Nov. 1-30	1	1	
Egypt:				
Alexandria	Dec. 3-9	1	1	
Cairo	Oct. 1-Dec. 16	12	8	
Esthonia:				
France:				
Gold Coast:				
Greece:				
Do				
Saloniki	Nov. 17-Dec. 15	3	2	
Do	Jan. 25-31	1		
Japan:				
Latvia:				
Lithuania:				
Mexico:				
Durango	Dec. 1-31	1		
Guadalajara	Dec. 23-29	1		
Mexico City	Nov. 9-Jan. 3	80		Including municipalities in Federal District.
Do	Jan. 11-31	29		
Palestine:				
Ekron	Dec. 23-29	1		
Jerusalem	do	2		
Do	Jan. 20-26	1		
Mikveh Israel	do	1		
Peru:				
Arequipa	Nov. 24-30	1		
Poland:				Sept. 28-Dec. 5, 1924: Cases, 379 deaths, 22.
Portugal:				
Lisbon	Dec. 29-Jan. 4	2		
Oporto	Jan. 4-Feb. 7	2		
Rumania:				
Do				Jan.-June, 1924: Cases, 2,906; deaths, 328.
Constanza	Dec. 1-10	1		July-Aug., 1924: Cases, 89; deaths, 12.
Russia:				Jan. 1-June 30, 1924: Cases, 92,000. July-Sept., 1924: Cases, 5,225.
Leningrad	June 29-Nov. 22	12		
Spain:				
Madrid	Year 1924	3		
Malaga	Dec. 21-27	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to March 13, 1925—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Sweden: Goteborg	Jan. 18-24	1		
Tunis				July 1-Dec. 20, 1924: Cases, 40.
Turkey: Constantinople	Nov. 15-Dec. 19	6	1	
Do.	Jan. 2-22	6		
Union of South Africa				Nov. 1-30, 1924: Cases, 233; deaths, 66.
Cape Province	Nov. 1-30	89	16	Dec. 21, 1924-Jan. 17, 1925: Out- breaks.
East London	Nov. 16-22	1		
Natal	Nov. 1-30	105	45	Dec. 14-20: Outbreaks.
Orange Free State	do	21	2	Dec. 7, 1924-Jan. 17, 1925: Out- breaks.
Transvaal	do	18	3	
Yugoslavia: Belgrade	Nov. 24-Dec. 7	4		Aug. 3-Oct. 18, 1924: Cases, 17; deaths, 2.

YELLOW FEVER

Gold Coast	October, 1924	3	3	
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